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Camp Creek Recreation Residence Continuation Determination Environmental Assessment

Tonto National Forest



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Summary

The Tonto National Forest proposes permitting the reconstruction of ten recreation residences destroyed in the Cave Creek Complex Fire of 2005, and issuing 43 recreation residence term special use permits for a 20 year period upon permit expiration. Prior to the 2005 fire, a total of 44 recreation residences were occupied. Since the fire, one permit has been voluntarily terminated. Therefore, 43 recreation residence permits are being considered for renewal and only ten residences would be rebuilt. All residences, including those to be rebuilt, would need to fully comply with county, state and federal law, regulation and policy and the terms of associated permits prior to issuing a new term special use permit.

The Camp Creek Recreation Residence tract is accessed from Forest Road 24 and is approximately seven miles north of the Cave Creek District office. The closest community to the tract is Scottsdale, Arizona.

The Forest Service conducted a recreation residence tract consistency review with the Tonto National Forest Land and Resource Management Plan (Forest Plan). The Forest Service found that the Camp Creek tract may not be consistent with direction, management prescriptions, standards, and guidelines contained in the Forest Plan. The Proposed Action in this document contains mitigation measures designed to make the tract compliant with the Forest Plan. Alternatives were developed to respond to the inconsistency and to public and natural resource management issues.

The Forest Service evaluated the following alternatives:

Alternative 1: No Action

In this alternative, recreation residence use would cease within ten years from the time the current term special use permits expire. The rebuilding of ten residences destroyed by fire would not be authorized. Thirty-three residences that are unaffected by fire or flood would be issued permits for a period not to exceed ten years. This alternative is consistent with Forest Service policy (FSM 2721.13) as it relates to recreation residences.

Alternative 2: Proposed Action

This alternative proposes to renew 43 recreation residence term special use permits for a 20-year period. The alternative includes direction and requirements for rebuilding ten residences that were destroyed by fire. In order to receive a 20-year permit, permit holders would need to be in full compliance with their existing term permit including operation and maintenance plans. This alternative would amend the Forest Plan.

Alternative 3: Modified Proposed Action

This alternative was developed in response to natural resource issues and addresses the need to be consistent with the Forest Plan. This alternative addresses the need to be in compliance with Executive Order 11988 and Forest Service policy (FSM 2527) regarding the management of structures and facilities within a floodplain. The alternative would move the recreation residence tract closer to the Forest Plan Management Area

1F watershed, riparian, and wildlife habitat resource objectives. The alternative includes direction and requirements for rebuilding residences that were destroyed by fire in 2005 and also provides tract-wide direction on those requirements needed to fully comply with county, state and federal law, regulation and policy. The alternative includes provisions to reduce the impacts to riparian habitat and water resources by reducing the number and type of structures that are located within both intermittent and perennial stream channels.

This alternative was designed in response to concerns about the constructed features in the floodplain of Camp Creek and its tributaries. Many walls and support structures associated with the recreation residences and their infrastructure have been built in the floodplain. In this alternative all constructed features within the 100-year floodplain will have to be removed no later than ten years from the date of the decision.

Twenty year permits would be issued for those lots where the residence is outside of the 100-year floodplain. Any walls, supports, or other constructed features within the 100-year floodplain would have to be removed within a negotiated time not to exceed ten years. The permit holders would need to be in compliance with the terms and conditions of their Operating and Maintenance (O & M) plans and all other federal, state, and county regulations before the 20 year permits are issued. Residences that were destroyed by fire could be permitted and rebuilt as long as they are outside of the 100-year floodplain.

Ten-year permits would be issued for those lots where the residence is inside the 100-year floodplain. The permit holders would need to be in compliance with the terms and conditions of their O & M plans. By the end of the 10-year term, all improvements would be removed at the expense of the permit holder. This alternative would amend the Forest Plan.

Document Structure

The Forest Service has prepared this Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA) and other relevant state and federal laws and regulations. This EA discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four parts:

- Chapter 1 Introduction: The section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- Chapter 2 Comparison of Alternatives, including the Proposed Action: This section provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- Chapter 3 Affected Environment and Environmental Consequences: This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource area (i.e. water resources, recreation resources). Within each section, the affected environment is described

first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.

- Appendices: The appendices provide more detailed information to support the analyses presented in the environmental assessment. Appendices include:
- Agencies and Persons Consulted
- Maps
- Literature and references cited

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Cave Creek Ranger District Office in Scottsdale, Arizona.

Chapter 1 – Purpose and Need

1.1 Background and History

History of Camp Creek Recreation Residence Tract

In an effort to attract visitors and encourage recreational use of the National Forest system a plan was developed in 1920 for the Camp Creek Recreation Residence tract, when the area was included within the Prescott National Forest. This 1920 plan or map identified 31 lots, some of which were labeled with people's names. The 1920 plan was implemented in 1923 when the Tonto National Forest boundaries were changed and the Camp Creek area was included as part of the Cave Creek Ranger District. The 1923 plan for the Camp Creek tract provided for a mix of public recreational use and recreation residence use including four public picnic grounds, 23 campsites, one parking lot and sites proposed for a tennis court and a Kiwanis club house. A 1926 plan revised in 1932 identifies 57 recreation residence lots, four public campgrounds, recreation residence outhouses, and a store and gas station adjacent to FR 24 at the entrance to Lower Camp Creek. During this time period, the Kiwanis clubhouse was divided into recreation residence lots and the Civilian Conservation Corps installed the Kentuck water system and possibly some retaining walls along Camp Creek. A 1939 inspection document revealed that 38 of the 57 lots were authorized by permit. In 1949, 18 lots were eliminated and ten lots were added for a total of 51 lots in the tract with no indication of provisions for general public use or access within the tract. It was during this time that Grapevine and Columbine lots were added and the store and gas station was abandoned. In 1955, the area on which all current recreation residences lie was formally withdrawn from Mineral Entry under PLO 1161, Bureau of Land Management serial number AR-04543 dated 6/6/1955. In 1959, seven lots were eliminated to bring the total lots to the current official number of 44, with no provision for access or use of the area by the general public. The Forest Service has determined that there are no vacant lots or in-lieu lots available for consideration of future use.

The Cave Creek Complex Fire of June 2005 destroyed 11 recreation residences. One residence owner has relinquished the special use permit and a new permit will not be issued once the lot has been restored (Residence #60 in the Grapevine Springs tract). Of the 43 remaining permits, all of which expire two years from the publication of the Consistency determination, ten permits authorizing the recreation residences that were destroyed have been placed in non-use status and no use is allowed or billed pending the completion of the analysis. The 33 remaining recreation residences are being administered to standard and are in various stages of compliance. Some administrative issues include non-native vegetation, storage, parking, outhouses, and off lot impacts, are currently being dealt with administratively.

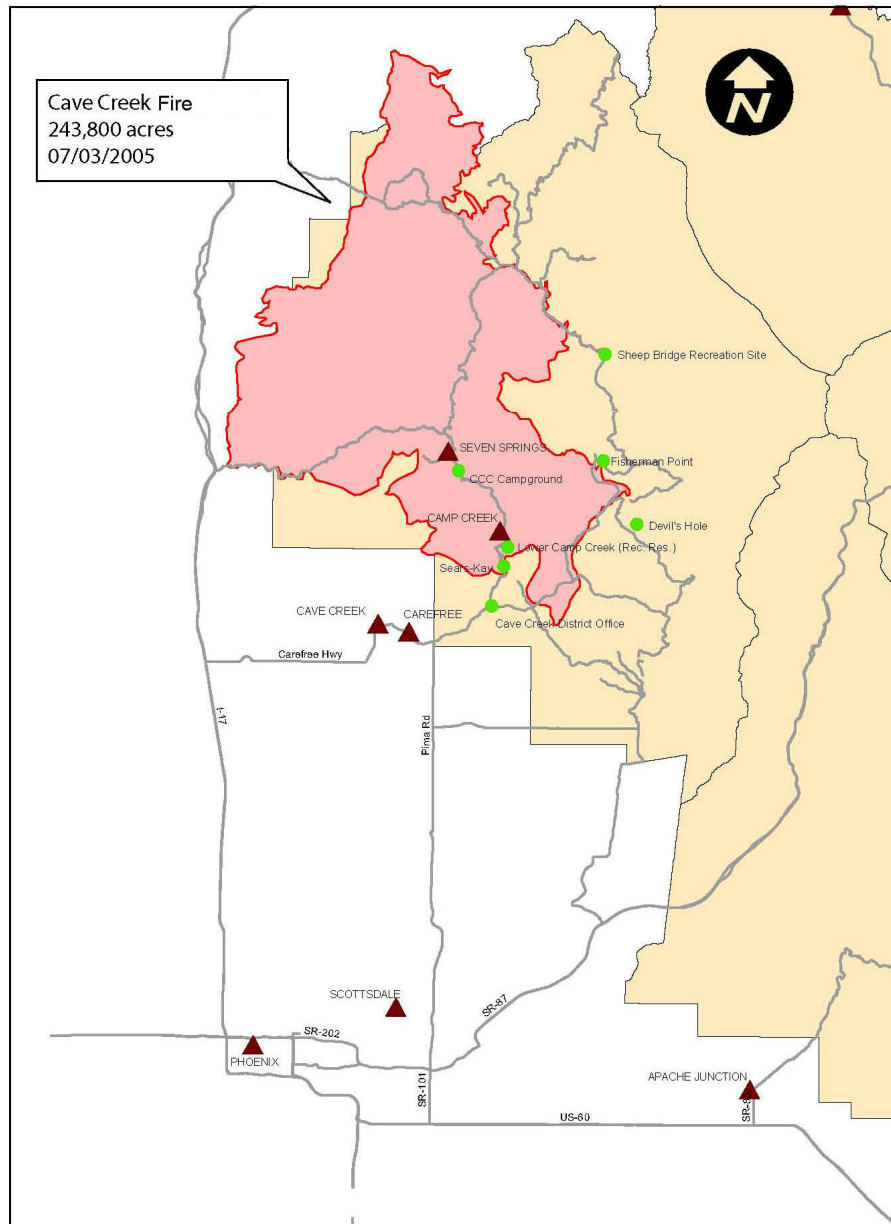
1.2 Location

The Camp Creek Recreation Residence tract with 44 established recreation residences lots is located on 873 acres on the Cave Creek Ranger District of the Tonto National Forest (Figure 1-1).

The oldest structure dates back to 1942, which demonstrates a long period of established use. The tract is accessed from Forest Road 24 and is approximately seven miles from the Cave Creek Ranger District office. The tract is located on National Forest

System (NFS) lands in sections 26 and 35 of T7N, R5E and section 2 of T6N, R5E, Gila and Salt River Meridian, in Maricopa County, Arizona.

Figure 1-1. Project Location Map Showing the Extent of the Cave Creek Complex Fire



The tract is broken into several units: (1) Columbine – five lots, (2) Upper Camp Creek – seven lots, (3) Middle Camp Creek – ten lots, (4) Lower Camp Creek – 18 lots, and (5) Grapevine – four lots (Figures 1-2 and 1-3). Recently, conditions changed for several lots. The Cave Creek Complex Fire of 2005 entirely destroyed 11 recreation residences. The fire also affected outbuildings and other structures such as footbridges. One permit holder has decided to voluntarily terminate their permit.

Figure 1-2. Camp Creek Recreation Residence Analysis Area Map

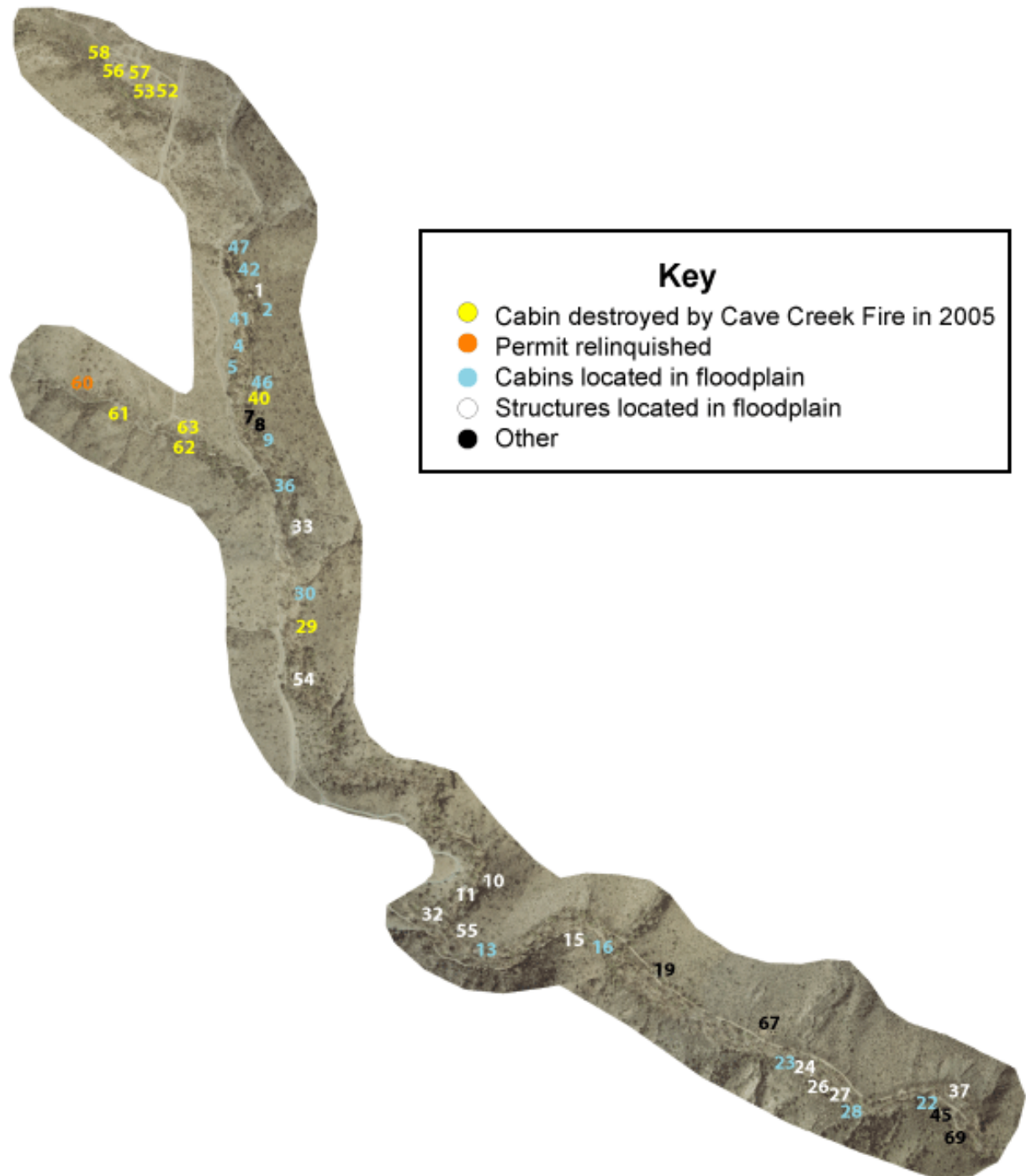
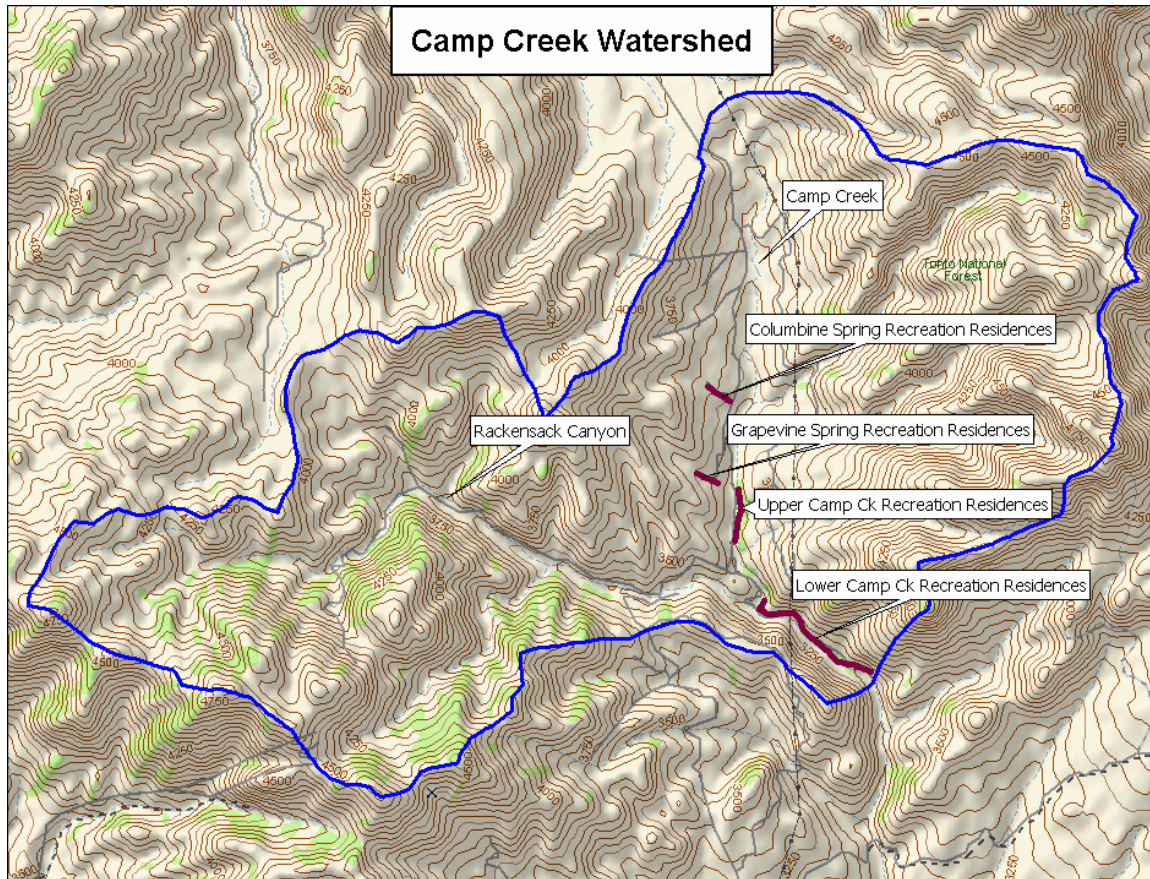


Figure 1-3. Camp Creek Watershed and Recreation Residence Tracts Map



1.2 Conditions that Determined the Need for Action

Forest Service policy (FSH 2709.11) states, “Following destruction or substantial damage of a recreation residence by catastrophic events or natural causes, allow rebuilding, if the lot can be occupied safely and the use remains consistent with the Forest Land and Resource Management Plan (Forest Plan).”

In 1994, Forest Service policy (FSH 2709.11, 4.23a) set direction for issuing new term (20-year) permits for recreation residences upon permit expiration. Decisions to issue new permits (following expiration) require a determination of consistency with the management direction found in the Forest Plan. When recreation residence use is consistent with the Forest Plan, it shall continue (FSM 2721.23E). In 1995, the Tonto Forest Plan was amended to include language regarding the need for a consistency determination for the re-issuance of permits (USDA-FS, 1985, Management Prescription 1F).

When recreation residence use remains consistent with the management direction provided in the Forest Plan, a new permit may be issued in accordance with the following provisions:

- (1) If the use has not been analyzed sufficiently as part of an EA or EIS completed within five years of permit expiration, complete the appropriate environmental analysis and documentation.

(2) Initiate the analysis and action to issue the new permit two years prior to expiration of the current term permit and notify the holder of the outcome of the action.

(3) Ensure the current use is in full compliance with the terms of the permit before issuing the new term permit.

(4) Review and update the term permit provisions to ensure that the new permit contains those clauses necessary to comply with all current regulations of the Secretary of Agriculture and all county, state, and federal laws, regulations, or ordinances which are applicable to the area covered by the permits (FSH 2709.11, 41.23a).

If recreation residence use is not meeting Forest Plan management direction, recommendations and mitigation measures on how the tract could meet the Forest Plan requirements are developed and included in a Proposed Action.

1.3 Forest Management Direction

The Tonto National Forest Land and Resource Management Plan (Forest Plan), as amended (USDA-FS, 1985) provides direction for all resource management programs on the Tonto National Forest. The Forest Plan embodies the provisions of the National Forest Management Act (NFMA) of 1976 and its implementation regulations, as well as those of other guiding documents (see "Laws" section). Goals, objectives, standards and guidelines specific to resources that could be affected by proposed activities are discussed in Chapter 3 in the affected environment and environmental consequences sections.

The project area is located in Management Area 1F (MA 1F) of the Cave Creek Ranger District. The project area is about 873 acres. The Cave Creek Ranger District comprises approximately 640,000 contiguous acres. MA 1F consists mainly of Sonoran desert type vegetation and chaparral/pinyon-juniper woodlands. Approximately 1,338 acres of MA 1F is riparian type. The management direction for MA 1F applies to a variety of renewable natural resources with primary emphasis on wildlife habitat improvement, livestock forage production and dispersed recreation. Watersheds are to be managed so as to improve them to a satisfactory or better condition. Riparian areas (as defined by FSM 2526) should be managed to improve riparian-dependent resources.

With regard to the Camp Creek Recreation Residence Tract, the Forest Plan states the following: "the existing Recreation Residence Term Special use Permits (FS-2700-18 [6/88]) for established lots within the Camp Creek Recreation Residence Area will continue in effect until December 31, 2009, unless revoked, terminated or relinquished. New permits may be re-issued for this area after the above expiration date, following completion of a determination of consistency as provided for in Clause IX of the above mentioned Term Special Use Permits."

1.4 Purpose and Need for Action

The purpose for the Proposed Action is to determine if rebuilding recreation residences and/or outbuildings affected by the Cave Creek Complex Fire should be allowed. A related purpose is to determine what conditions would apply to reconstruction. Although there were 11 recreation residences damaged by the fire, one permit has been voluntarily relinquished. The need for action is a result of the Cave Creek Complex Fire

of 2005 and a need to follow Forest Service policy when substantial damage or destruction to a recreation residence has occurred.

For all recreation residences (those affected by fire and those not affected by fire) the purpose of the project is to determine if new 20-year permits, and the associated road and water transmission line permits, should be issued in 2010 when the current permits expire. The need for action is to follow both policy and the Forest Plan for general permit re-issuance when expiration is imminent. Both policy and the Forest Plan require a consistency review. There is a need to determine if the recreation residence use is consistent with the Forest Plan.

Results of Consistency Review

This analysis includes a consistency review for the tract. Resource information on flood plain and riparian conditions was identified through public comment. Upon reviewing the Forest Plan and the available information, the Forest Supervisor determined that the recreation residence tract might not be consistent with the Forest Plan and Forest Service policy for the management of watersheds, riparian habitat, and wildlife habitat.

1.5 Proposed Action

In response to the purpose of and need for action, the Tonto National Forest proposes to renew 43 recreation residence term special use permits for a 20-year period. The alternative includes direction and requirements for rebuilding ten residences that were destroyed by fire. In addition, tract-wide direction on specific requirements (mitigation) needed to fully comply with county, state and federal law; regulation and policy (the terms of the special use permit) would be provided. An amendment would be added to the present Tonto National Forest plan, see appendix G for proposed amendment.

This alternative would allow for the reconstruction of ten recreational residences affected by the Cave Creek Complex Fire. The following requirements would apply for reconstruction:

- Two footbridges, which provide access to the residences in the Grapevine and Middle Camp Creek units, would be reconstructed. One footbridge would cross Camp Creek and one footbridge would cross Grapevine Creek. Permit holders would be responsible for submitting plans and receiving Forest approval regarding design and type.
- The allowable number of structures or building size (square footage) would not exceed what was previously authorized on the special use permit.
- Rehabilitation activities, including demolition, grading, and re-contouring would be limited to those areas previously disturbed by road construction, terracing, leveling and building construction. All buried pipelines would be left in place and any exposed pipe cut flush with the ground surface and capped. All abandoned septic and water systems would need to be in compliance with applicable county, state and federal regulations. Undisturbed areas or areas considered sensitive would be marked for avoidance by the Forest Service. All roadwork necessary for access would be confined to the existing road prisms.
- Permit holders must be in compliance with the terms and conditions of their current term permit prior to the issuance of the new term permit (FSH 2709.11, 41.23a, 3).

The following conditions would apply for the issuance of the 20-year term special use permits to those recreation residences that are unaffected by fire:

- Permit holders must be in compliance with the terms and conditions of their current term permit prior to the issuance of the new term permit (FSH 2709.11, 41.23a, 3).
- Given current county septic system regulations and requirements, there may not be enough space within the recreation residence lot boundaries to install new or upgraded septic systems. Forest Service authorization to install all or portions of septic systems outside of the lot boundaries may be considered on a case-by-case basis.
- Road access to Grapevine, Columbine, Upper Camp Creek, Middle Camp Creek and Lower Camp Creek would be authorized with a new special use permit issued to the Camp Creek Community Association.
- Water system special use permits would be issued to the Camp Creek Community Association for both government-owned and privately-owned water systems that carry water from the Kentuck, Columbine and Grapevine springs.
- Proposals for major modifications to the existing water systems will be considered under a separate Environmental Assessment.
- Any future rehabilitation activities, including demolition, grading and re-contouring would be limited to those areas previously disturbed by road construction, terracing, leveling and building construction. All buried pipeline would be left in place and any exposed pipe cut flush with the ground surface and capped. All abandoned septic and water systems would need to be in compliance with county code. Undisturbed areas or areas considered sensitive would be marked for avoidance by the Forest Service. All roadwork necessary for access must be confined to the existing road prisms.

The following conditions would apply for the term special use permits that may not be consistent with the Forest Plan:

- Twenty-eight recreation residences have Maricopa County septic system permits. It is assumed that the systems are in compliance with county requirements because there are no indications that the systems are not functional.
- Five recreation residences have undocumented septic systems and would be required to comply with all county reviews, approvals and permits.

Scope of the Analysis

The Forest Service has determined that an Environmental Assessment is needed to document the public involvement, issues, and impacts of the decision on continuation of recreation residence use in the Camp Creek tract. An Environmental Assessment (EA) is an investigation of a proposed action and alternatives to that action and their direct, indirect, and cumulative environmental impacts. The EA process provides the necessary information for reaching an informed decision and the information needed for determining whether a proposed action may have significant environmental effects.

Three alternatives to the proposed action have been selected for this EA. Each of the alternatives is described in detail in Chapter 2 of this document. The analysis is specific to the recreation residence tract on the Cave Creek District and does not consider other recreation residence tracts on the Tonto National Forest.

1.6 Decision Framework

Given the purpose and need, the responsible official will review the proposed action, the other alternatives, the environmental consequences and comments from the public and other agencies in order to make a decision. The responsible official may decide to: (1) select the Proposed Action, (2) select one of the alternatives, (3) select one of the alternatives after modifying the alternative with additional mitigation measures or a combination of actions from other alternatives or (4) select the No Action Alternative.

1.7 Responsible Official

The Forest Supervisor for the Tonto National Forest is the responsible official who will decide which actions are to be implemented and that are in compliance with federal policy, laws and regulation. The Forest Supervisor will document decisions and rationale in a Decision Notice/Finding of No Significant Impact. The following factors will be considered when making the final decision:

- Determine if the recreation residence tract is consistent with the Forest Plan.
- If residences are approved for rebuilding, determine if the lots can be occupied safely (FSM 2721.23a.13).

1.8 Permits and Agency Approvals Required

The following permits or authorizations would be required for project implementation:

- Consultation and concurrence from the Arizona State Historic Preservation Office regarding identification, and evaluation of heritage resources to meet the requirements of the Section 106 of the National Historic Preservation Act.
- Army Corps of Engineers 404 permit for discharge of dredge or fill material into Camp Creek or other waters of the US. Discharges of material may be authorized under various nationwide permits that authorize those activities that have minimal individual and cumulative adverse effects on the aquatic environment and satisfy other public interest factors. Water Quality certification (401 certification) is necessary from the Arizona Department of Environmental Quality (ADEQ) for all 404 permits.

2 Chapter 2 – Alternatives

2.1 Introduction

This chapter describes the alternative development process, including how public comments identify issues and help formulate the alternatives. This chapter defines the alternatives considered for analysis and the alternatives considered but eliminated from detailed study.

For this project, four alternatives are carried forward and analyzed in Chapter 3, including Alternative 1, the No Action Alternative. Alternative 2, the Proposed Action, was developed in response to a preliminary recreation residence consistency review. Alternative 3 was developed as a result of public comment and the Forest Plan consistency review process. Five alternatives that were considered by the Interdisciplinary Team (IDT) and eliminated from detailed analysis are listed and described in Appendix H.

Table 2-3, found at the end of this chapter, displays a comparison of the purpose and need and issues by alternative.

2.2 Public Involvement

The project proposal and request for comment was mailed to approximately 92 members of the public and other agencies on February 2, 2006. On February 17, 2006, the Cave Creek District Ranger and the District Recreation Officer met with officers and board members of the Camp Creek Community Association (CCCA) to discuss the request for comment letter and the analysis process. Although the 30-day request for comment period ended on March 6, 2006, comments continued to be accepted until May of 2006. Seventeen comments were received in the form of letters, facsimiles, or email. On March 31, 2006, the District Ranger and key staff attended the annual CCCA meeting to discuss the analysis. On April 10, 2006, a letter was sent to the president of the CCCA responding to the questions raised during previous meetings. On April 28, 2006, the Cave Creek District fire staff and recreation officer reviewed 15 lots with the recreation residence owners and discussed wildland fire protection measures.

Meetings with recreation residence owners were also held on February 17, 2006; August 28, 2006; April 27, 2007; and January 24, 2008, March 10, 2008 and May 21, 2008.

The proposal has been listed in the Tonto National Forest Schedule of Proposed Actions (SOPA) since January of 2006.

2.3 Issues

Two levels of issues are used in this analysis. Key issues are those within the scope of the project of sufficient concern to drive the development of alternative actions. The key issues are specific to this geographic area and proposal, and provide a good comparison between alternatives during analysis. Analysis issues are those that are not critical in developing alternatives but are important for their value in designing specific protective measures and to measure the effects of the alternatives on different resources.

The Interdisciplinary Team (IDT) identified “issue indicators” to measure how each analysis issue would be affected by the alternatives. Each issue may have more than one indicator, depending on its complexity. Issue indicators were selected for their ability to show the differences between alternatives.

Issues were not considered if they were:

- Outside the scope of the proposed action
- Already decided by law, regulation, or other higher-level decision
- Irrelevant to the decision to be made
- Conjectural and not supported by scientific or factual evidence
- General comment

The Council for Environmental Quality NEPA regulations requires this delineation in Section 1501.7, "Identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Section 1506.3)..." A list of comments not developed as issues and reasons regarding their categorization as non-issues may be found in the content analysis in the project record.

Key Issues

The key issues were developed as a result of public comments and internal scoping of resource staff and from the Forest Plan consistency review process. Regarding public comments, the IDT carefully reviewed the comments received during the 30-day scoping period. The majority of comments were from the permit holders or the friends and family of the permit holders. Comments from this group fully supported permit renewal. Two comments (two internal and one external) addressed the need to minimize or eliminate the effects the recreation residences have on the Camp Creek perennial stream and riparian areas and to provide access for the recreating public.

Floodplain and Riparian Area Functions and Values

Camp Creek is a rare perennial stream in the Upper Sonoran desert ecosystem and is a tributary of the Verde River. The Camp Creek floodplain is constricted or altered in several places where it flows through the Camp Creek Recreation Residence tract. Forest Service policy and rules provide direction for protecting stream resources including floodplain function. Alternative 3 was developed to analyze the effects of restoring the natural function of the Camp Creek floodplain. In Alternative 3, the presence or absence of built structures in the 100-year floodplain is used as a measure of floodplain function.

Floodplain Associated Resource Analysis

Four analysis issues were identified and are described below. Each issue has one or more issue indicators that will be used to evaluate the environmental consequences of each alternative.

During the consistency review process, additional resource inventory was completed. Extensive hydrologic field surveys and analysis were conducted to gather information on structures in the 100-year floodplain and additional resource inventories were conducted for vegetation, wildlife and riparian resources. As a result, the Consistency Review identified resource areas (dispersed recreation, wildlife, fisheries and riparian) where the recreation residence use may not be consistent with the Forest Plan.

Resource Analysis Topic 1 – Dispersed Recreation

The location of the recreation residence tract tends to exclude the general public from use and enjoyment of the Camp Creek tract for dispersed recreational activities such as hiking, bird watching, picnicking and hunting. This exclusion of the general public is due to the most desirable areas for dispersed recreation being occupied by recreation residence improvements and the public perception that the area is off-limits due to the presence of homes and locked gates on roads accessing the tract off the 7 Springs Road (FR24).

Dispersed Recreation Issue Indicator: relative amount of available and desirable riparian area-based recreational opportunities

Resource Analysis Topic 2 – Wildlife

The recreation residences occupy riparian area critical to the viability of a wide array of wildlife species requiring contiguous plant cover for food and protection.

Wildlife Issue Indicator: relative change in available riparian habitat

Resources Analysis Topic 3 – Fisheries

The recreation residences and associated structures, such as retaining walls, have altered the stream habitat impacting the viability of fish populations.

Fisheries Issue Indicator: short term (0 to ten years) and long term (11 to 30 years) change in fish abundance and distribution in the analysis area

Resource Analysis Topic 4 – Riparian Areas

Recreation residences and associated structures such as retaining walls located within or in close proximity to both intermittent and perennial streams are affecting the recruitment and retention of riparian vegetation. The presence and proliferation of non-native invasive species is negatively affecting the recruitment and retention of native species.

Riparian Area Issue Indicator: the relative change in available area to host riparian vegetation.

2.4 Alternatives Considered and Analyzed

Features Common to All Alternatives

1. When new permits are issued, permit operation and maintenance plan would be developed.
2. Residents would work with the Forest Service to provide defensible space around the recreational residences.
3. There are 15 residences (and their associated structures) within the 100-year floodplain. Should flood damage occur within the permit period to the point that reconstruction or new construction is needed, no rebuilding would be authorized and the permit would be terminated. Clause E-17, a Forest Service permit clause that addresses the management of residences within floodplains, would become part of the new permit. This clause will be included and will apply regardless of the length of the permit period.

4. Approximately ten acres of non-native vegetation (weeds) that is affecting the recruitment and retention of native species would be removed throughout the tract through manual pulling or approved aquatic herbicide. The primary species to be removed include 3.8 acres of vinca and 1.3 acres of Jerusalem thorn. Other species include oleander, Arundo, pyracantha, fan palm, Aleppo pine saplings, buffelgrass, fountaingrass, English ivy, riggut brome, yellow sweetclover and ice plants. The Tonto National Forest staff would work cooperatively with the tract to address the removal of non-native species and the process for replanting disturbed areas with desirable vegetation.
5. Permit holders would need to be in compliance with the terms and conditions of their current term permit, which includes all state, and county regulations prior to the issuance of the new 20-year term permit (FSH 2709.11, 41.23a, 3).
6. The recreation residences that have undocumented septic systems would be required to be compliant with Maricopa County regulations, including all county reviews, approvals and permitting. Once this is completed, these permit holders would be in compliance with this condition in the term special use permit. The current County septic system regulations and requirements may require more space than is available in some recreation residence lot boundaries to install new or upgraded septic systems. Forest Service authorization to install all or portions of septic systems outside of lot boundaries may be considered on a case-by-case basis.
7. Any future rehabilitation activities, including demolition, grading and re-contouring would be limited to those areas previously disturbed by road construction, terracing, leveling and building construction. All buried pipeline would be left in place and any exposed pipe cut flush with the ground surface and capped. All abandoned septic and water systems belonging to permittees would be removed. Undisturbed areas or areas considered sensitive would be marked for avoidance by the Forest Service. All roadwork necessary for access must be confined to the existing road prisms.
8. Recreation residence lots with outhouses or pit toilets would need to comply with Maricopa County regulations. Outhouses would need to be inspected, filled and sealed as needed. Converting outhouse buildings to alternative use may be considered. Prior to any work on outhouses, approval must be obtained from the Forest Service.
9. As footbridges are approved for replacement or substantial repair, structures would be located outside of the 100-year floodplain to reduce the number and type of structures that could affect riparian habitat, and stream and floodplain function.
10. Should future repair or replacement of roads serving the tract be required, opportunities to relocate (or provide alternative parking and foot access) roads out of intermittent and perennial stream channels would be sought to reduce the number and type of structures that could affect riparian habitat and stream health.
11. The entire recreation residence tract would be closed for resident occupancy and use when a forest-wide fire closure is in effect. This measure would reduce the risk to human life during wildfire.

12. One residence owner has relinquished their special use permit and a new permit will not be issued once the lot has been rehabilitated (Lot #60 in the Grapevine Springs tract).
13. A special use permit up to the 10-year term would be issued to the Camp Creek Community Association for both government owned and privately owned water systems utilizing the Kentuck, Columbine and Grapevine springs.
14. The continued use of Kentuck, Columbine, and Grapevine Springs will require water system repair and modifications, at the permit holder's expense.

Table 2-1. Recreation Residence Status by Lot Number

Recreation residences Destroyed by Cave Creek Complex Fire in 2005, n = 11	29	40	52	53	56	57	58	60	61	62	63					
Recreation residences in Floodplain, n = 15	2	4	5	9	13	16	22	23	28	30	36	41	42	46	47	
Structures in Floodplain, n = 14	1	10	11	15	24	26	27	32	33	37	40	54	55	57		
Residence Permit Relinquished	60															

Alternative 1 – No Action (Recreation residences are removed within ten years)

This alternative is based on the Forest Service policy definition of No Action as it relates to recreation residences. In this alternative, recreation residence use would cease within ten years (upon permit expiration). It would not authorize the rebuilding of residences destroyed by fire.

Design Criteria Common to all Residences in Alternative 1:

- The current term special use permits would expire on December 31, 2009, and the Forest Service would not issue 20-year permits for the recreation residences. However, 10-year permits would be issued to permit holders who are in compliance with the current permit and with county, state, and federal regulations prior to the issuance of the shorter term permit (FSH 2709.11 41.23(a)(3)). Septic and water systems would need to be brought into compliance with both Maricopa County and state requirements.

- For permit holders not in compliance with the terms of their current permit by December 31, 2009, a one-year temporary permit will be issued to enable them to come into compliance. If at the end of that one-year period, they remain in non-compliance the permit will be allowed to terminate and all improvements will be removed from National Forest lands. For those who are in compliance after this one-year period, new permits up to the 10-year term would be issued.
- By the end of the 10-year permit term, all above-ground improvements would be removed from National Forest System lands at the expense of the permit holders (FSM 2721.13c). Improvements include home-related structures both on and off the permitted lot, Home Owner Association water system components, driveways, overhead wiring, propane tanks, and power/phone transmission lines. Permit holders would also be required to pump and remove septic tanks, and remove all structures related to patios, retaining walls and stone walkways. Each permit holder would be required to restore the lot and those areas they have used or modified by removing structure foundations and reshaping to natural contours and landscaping. Pipelines, underground wiring, sewage distribution boxes, driveways, parking areas, and drain fields would be removed.
- For residences destroyed by fire, rebuilding would not be allowed. These permit holders would be required to remove any remaining structures from their lots and in off-lot areas they have utilized or modified. This includes those structures that have been constructed off the designated lot. The entire use area would need to be returned to its natural state as described in the paragraph above within the time specified by the Forest Service.
- Road access to Grapevine (0.3 mile), Columbine (0.1 mile), Upper Camp Creek (0.2 mile), Middle Camp Creek (0.1 mile) and Lower Camp Creek (1 mile) would be authorized with one special use permit issued to the Camp Creek Community Association. This permit would have a 10-year term.

Alternative 2 – The Proposed Action

In this alternative, the Cave Creek Ranger District proposes to renew 43 recreation residence term special use permits for a 20-year period. The alternative includes direction and requirements for rebuilding ten residences that were destroyed by fire. This alternative would amend the Forest Plan so the Camp Creek Recreation Residence Tract is consistent. (see Appendix G).

Design Criteria Common to all 43 Residences in Alternative 2:

- Road access to Grapevine (0.3 mile), Columbine (0.1 mile), Upper Camp Creek (0.2 mile), Middle Camp Creek (0.1 mile) and Lower Camp Creek (1 mile) would be authorized with one special use permit issued to the Camp Creek Community Association. This permit would have a 20-year term.

Actions Specific to Ten Residences Destroyed by Fire

- Rebuilding of ten recreation residences would occur. The following conditions would apply for reconstruction: building, water and waste systems comply with Maricopa County building, environmental health and fire codes.

- The two foot bridges across Camp Creek to be rebuilt would need to be constructed without supports or structures in the 100-year floodplain. The permit holder would be responsible for submitting plans and receiving Forest approval regarding design and type of any footbridges.

Alternative 3 – Restoring Floodplain and Riparian Area Functions and Values

This alternative was designed in response to concerns about the effects of constructed features on the functions and values of the floodplain and riparian area of Camp Creek and its tributaries. Many walls and support structures associated with the recreation residences and their infrastructure have been built in the floodplain. In this alternative all constructed features within the 100-year floodplain would be removed no later than ten years from the date of the decision.

Twenty-year permits would be issued for those lots where the residence is outside of the 100-year floodplain. Any walls, supports, or other constructed features within the 100-year floodplain would be removed within a negotiated time not to exceed ten years.

Ten-year permits would be issued for those lots where the residence is inside the 100-year floodplain. By the end of the 10-year term, all improvements would be removed at the expense of the permit holder.

This alternative would amend the Forest Plan so that homes and associated structures outside the floodplain are consistent, (see Appendix G).

Actions Specific to Residences Destroyed by Cave Creek Complex Fire of 2005

- Rebuilding of recreation residences could occur unless they are located in the floodplain.
- The two foot bridges across Camp Creek to be rebuilt would need to be constructed without supports or structures in the 100-year floodplain. The permit holder would be responsible for submitting plans and receiving Forest approval regarding design and type of any footbridges.

Design criteria for permitting the continued use and occupation of the residences:

- No rebuilding of structures in the 100-year floodplain would be permitted.
- As a condition for rebuilding, the Columbine Road would be repaired and reconstructed by the permit holder to Forest Service standard (low maintenance level 2). Actions would include grading, the installation of drainage features (such as water bars) and signs that meet Forest Service standards.
- Road access to Grapevine (0.3 mile), Columbine (0.1 mile), Upper Camp Creek (0.2 mile), Middle Camp Creek (0.1 mile) and Lower Camp Creek (1 mile) would be authorized with one special use permit issued to the Camp Creek Community Association. This permit would have a 20-year term.
- One in-stream check dam, located below Lot 63, would be removed to facilitate the removal of debris within Grapevine Creek.

2.5 Mitigation Measures Common to All Alternatives

To mitigate is to offset or lessen real or potential impacts of an activity through the application of additional controls or actions. Countermeasures are employed to reduce or eliminate undesirable or unwanted results. To mitigate resource impacts, the following mitigation measures were developed. To ensure proper application of these project specific mitigation measures, their implementation and effectiveness are monitored frequently. This monitoring process occurs before, during, and after (up to several years later) project implementation. The Monitoring section found in Appendix E describes how and when mitigation measures are monitored, as well as who monitors them.

In the mitigation measures tables, the *Expected Effectiveness* column is included to give the reader an idea of how well these mitigation measures work from past experiences and/or research. The environmental effects described in Chapter 3, the Affected Environment and Environmental Consequences Section, are based on these effectiveness levels. Determination of effectiveness is a specialist's professional opinion on what he or she has experienced with certain mitigation measures. The number in the *Expected Effectiveness* column corresponds to the following statements:

1. Almost always reduces impacts significantly. Almost always done in this situation.
2. Usually reduces significant impacts. Often done in this situation.
3. Effectiveness monitoring will be conducted during project implementation and other appropriate times. Completing effectiveness monitoring is the responsibility of the District Ranger.

Table 2-2. Mitigation Measures

No.	Mitigation Measure	Why	Expected Effectiveness
Heritage			
H1	Leave all archaeological remains from abandoned lots, abandoned recreation sites, and earlier historic occupations in place (Lots 12, 43, 44, 45, 59, & 69). All Alternatives	To preserve some physical remnants of the CCRRA for future study and interpretation.	2
H2	Document all features to be removed with photography and drawings; attempt to document the demolition of those residences listed as contributing elements (Lots 9, 15, 28, & 47 garage) and those residences identified as likely having incorporated earlier historic structures (Lots 2, 5, 16, 45, & 47 residence). Alternatives 1 & 3	To recover as much information about the CCRRA as an historic property as possible without preservation in place.	2
H3	Document with photography and drawings (as necessary) all WPA-built toilets scheduled for filling and sealing. Ensure that permit holders maintain them sufficiently to minimize weathering and other deterioration. Alternative 2	To preserve some physical remnants of the CCRRA for future study and interpretation and reduce the impact of their modification to the level of No Adverse Effect.	1
H4	Inspect and document with photography and drawings (as necessary) all WPA-built toilets scheduled for removal. Select at least one for removal (privy, riser, and concrete vault cap/floor) and relocation to be refurbished as an interpretive display. Alternatives 1 & 3	To preserve some physical remnants of the CCRRA for future study and interpretation.	2

Wildlife and Aquatics			
W1	Rehabilitate and maintain mixed broad leaf riparian to achieve 80% of the potential overstory crown coverage. Natural and / or artificial regeneration, depending on site characteristics. Permit large woody material (dead / down) to remain within Camp Creek and in adjacent riparian and upland areas. All Alternatives	Goal of 80% potential overstory crown coverage is identified in Tonto Forest Plan (1985) as Management Prescription for all riparian areas on the Tonto Forest. Large woody material permitted to remain within the creek and adjacent riparian / upland areas to facilitate development of complex aquatic and terrestrial habitats and nutrient cycling. Intent is to improve riparian / aquatic habitats and ecosystem function.	3
W2	Maintain minimum of 30% effective ground cover for watershed protection and forage production. All Alternatives	Identified in Tonto Forest Plan (1985) as Management Prescription for all management areas on the Tonto Forest. Improve ground cover for watershed protection, wildlife habitat and forage production.	3
W3	Remove non-native / invasive plants. All Alternatives. *NOTE: more appropriate in Nonnative/invasive mitigation section.	To reduce potential for non-native / invasive plant proliferation, which will lead to re-establishment of native plants, improved ecosystem function and improved wildlife habitats.	3

Non-native Invasive Species			
IS1	Require any equipment working in the Camp Creek area to be free of all soil and plant parts when it is brought in.	Prevention of new infestations	1
IS2	Require weed-free straw and/or mulch in any restoration work.	Prevention of new infestations	1
IS3	Have seed lots checked by a state lab for the Tonto's list of invasive plants before it is mixed for use to revegetate disturbed areas.	Prevention of new infestations	2
IS4	Follow best management practices, and all conservation measures in the Forest Weed EA, when working with herbicides.	Safety and health of National Forest workers and the public	1

IS5	Any soil brought into the area must be from a site that has been inspected for weeds and found to be free of any weeds on the Tonto noxious weed list.	Safety and health of National Forest workers and the public	1
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Visuals			
V1	Combination of adequate screening, natural materials, and earth tones should be used	Reduce contrasts to natural form, line, color, and texture of the surrounding landscape as seen from key viewpoints.	2
V2	Vegetation Management: Plant vegetative buffer to screen of Upper, Middle, and Lower Camp Creek from Forest Roads 24 and 24F.	Reduce contrasts to natural form, line, color, and texture of the surrounding landscape as seen from key viewpoints.	2
V3	Earthwork and Grading: Blend cut and fill slopes into adjacent natural topography	Reduce contrasts to natural form, line, color, and texture of the surrounding landscape as seen from key viewpoints.	2
V4	Structures and Roads: Construct roads with minimal cut and fill slopes	Reduce contrasts to natural form, line, color, and texture of the surrounding landscape as seen from key viewpoints.	2

2.6 Monitoring

Monitoring provides a quality control and adaptive management strategy. By monitoring the effects of treatments and then evaluating the results, we are able to make modifications in management practices, assess resource trends and apply new knowledge to similar projects in the future. Monitoring and evaluating informs the decision maker, specialists, and interested public of the progress made toward the goals and objectives during the implementation of projects.

The purpose of monitoring and evaluating the implementation of the Forest Plan is to inform the decision-maker of the progress toward achieving the goals, objectives, and standards and guidelines. Monitoring is used to determine if, the management prescriptions is applied as directed, standards are being followed, the Forest is achieving the objectives of the Forest Plan, the application of management prescriptions is responding to public issues and management concerns, the effects of implementing the Forest Plan are occurring as predicted, the costs of implementing the Forest Plan are as predicted and are acceptable, management practices on adjacent or intermingled non-Forest lands are affecting the Forest Plan goals and objectives.

A detailed annual monitoring action program will be prepared as part of the total forest annual program of work. This annual monitoring program will include the details on the amount and location of monitoring to be accomplished based on the approved program of work and funds available for monitoring. Specific locations, intensity of sampling,

person days required, and costs, will be identified in the annual monitoring program. The activities to be monitored will be selected from this list in the Forest Plan.

All monitoring activities will be documented. If monitoring results indicate that laws, regulations, standards or objectives are not being met, or that mitigation measures are not effective, the activity will be modified to remedy or ameliorate the problem. All the monitoring data will be consolidated and available for review by interested parties.

2.7 Comparison of Alternatives

This section provides a quantitative summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively between the No Action and the action alternatives. Qualitative discussions on the different level of effects between the No Action and the action alternative are displayed by resource in Chapter 3 in Environmental Consequences.

Table 2-3. Comparison of Features by Alternative

Features and Actions	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3 Restoring Floodplain and Riparian Area Functions and Values
Number of Recreation Residence Lots	43	43	43
Recreation residences Rebuilt	0	10	10
Number of Recreation residences Removed in ten years	All	0	15
Number of 20-year Permits	0	43	28
Number of 10-year Permits	Tbd*	0	15
Road Access to Upper, Middle and Lower Camp Cr.	10 years	20 years	20 years
Water System Permit	10 years	20 years	20 years
Recreation residences and other Structures Removed from 100-year Floodplain	10 years	0	10 years
Dispersed Recreation Improvements	no	no	no
Road Closures and Roads Rehabilitated	no	no	no
Non-native Vegetation Removal	yes	yes	yes
Riparian Habitat Improvement	yes	no	yes

*Tbd-To be determined based on permittee compliance with federal, state and county laws, regulations and policies.

Table 2-4. Comparison of Effects by Alternative*

	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3 Restoring Floodplain and Riparian Area Functions and Values
Dispersed Recreation Issue Indicator: relative amount of available and desirable riparian area-based recreational opportunities	Short term - Medium; long term - High*	Low*	Low*
Wildlife Issue Indicator: relative change in available riparian habitat.	High*	Low*	Medium*
Fisheries Issue Indicator: short term (0 to ten years) and long term (11 to 30 years) change in fish abundance and distribution in the analysis area.	Short Term: High* Long Term: High*	Short Term: Low* Long Term: Low*	Short Term: Medium* Long Term: Medium*
Riparian Area Issue Indicator: the relative change in available area to host riparian vegetation.	Restores 10.5 acres of currently impacted riparian area-High*	Maintains status quo of riparian areas impacted-Low*	Reduces impacts to riparian areas within 100-year floodplain to less than 10.5 acres-Medium*

*See Effects Section for analysis of these factors.

3 Chapter 3 - Affected Environment and Environmental Consequences

3.1 Purpose and Organization of this Chapter

This chapter presents the existing conditions within each resource's affected environment and the potential effects of the alternatives on each resource. The Affected Environment section provides general information about the resource and establishes a baseline against which effects of the alternatives may be compared. The Environmental Consequences section discloses the potential direct, indirect, and cumulative effects of the alternatives on each resource.

In this analysis, direct and indirect effects are described for those activities that are proposed to occur based on the decision made. Cumulative effects consider the effects of past, present and reasonably foreseeable activities on both Federal and non-Federal lands. Each resource analyzed has a defined cumulative effects analysis area, which may be different for each resource.

3.2 Recreation, Lands and Minerals

Affected Environment

Analysis Area

The analysis area for recreation, lands and minerals resources is physically defined as the 873 acre area currently occupied by the Camp Creek Recreation Residence tract containing 44 recreation residence lots. However, for the purpose of this portion of the analysis, impacts of the tract on Recreation, Lands and Minerals, will be analyzed that reach beyond the 873 acre area of the tract.

Recreation Setting – Recreation Opportunity Spectrum (ROS)

The Forest Service has developed a framework for understanding the relationships between these different recreation opportunities and their desired settings, and this framework is called the Recreation Opportunity Spectrum (ROS). The Cave Creek Recreation residence analysis area is designated Rodeo Natural. A complete description of these classifications is found in the Tonto Forest Plan, Recreation Opportunity Spectrum Class Characterization.

Methodology

The methodology used to gain information for this portion of the analysis included a complete review of Forest Service regulation and policy and the Forest Plan as these sources pertain to the management of recreation residences. Other sources of information included special use permit files, historic maps and drawings of the Camp Creek recreation residence tract as well as information obtained from past and present Cave Creek Ranger District employees and current recreation residence permit holders. Information on current and anticipated types and levels of use within and adjacent to the Camp Creek tract was obtained through Forest Service employee personal observations, as well as National Visitor Use Monitoring Surveys completed in 2002, and traffic counters on Forest Road (FR) 24.

Issuance of permits allow for use, occupancy, and maintenance of recreation residences. These structures are maintained for the use and enjoyment of the holders and their guests. Recreation residences must be used at least 15 days per year, but cannot be used as a principal residence. Off-lot improvements such as water systems and roads are authorized separately to the homeowners association through special use permits.

Recreation Analysis Issue

Issue 1: Dispersed Recreation and Interpretation Opportunities

The analysis area has been and continues to be managed for multiple uses. There is a long tradition of recreational residence use. Currently, with the exception of the recreation residence owners and their guests, there are very limited dispersed recreation opportunities available to the recreating public within the 873-acre Camp Creek recreation residence tract. The most desirable areas for dispersed recreation are occupied by recreation residences and there is a public perception that the area is off-limits due to the presence of homes and locked gates on roads accessing the tract off the 7 Springs Road (Forest Road 24).

Indicators used to analyze environmental consequences to the recreation resource:

Relative amount of available and desirable riparian based interpretation and dispersed recreation opportunities; range: High, Medium, Low.

Environmental Consequences

Alternative 1 - No Action (Recreation residences are Removed within ten years)

Direct and Indirect Effects

Under the No Action alternative, in the short term, recreation access opportunities would remain unchanged. Existing roads, such as Forest Road (FR) 24, would be used more heavily in the future in proportion to the increased population growth of the Phoenix Metropolitan Area.

In the short term, the No Action alternative would also have minimal to no effect on access to existing dispersed camping, picnicking, scenic viewing and hunting opportunities outside the analysis area. Recreation residence permits would be administered to ensure the current use is in full compliance with the terms of the permit. Dispersed Recreation use would remain very limited during the period that the recreation residences are there.

In this alternative the rebuilding of ten recreation residences destroyed by the fire would not be authorized. These ten lots would have remnant structures removed and the lots re-contoured, the water system and related pipes, servicing these lots would be removed and the spring flows restored. Septic and drinking water systems would be removed and abandoned in accordance with current Federal, State and County requirements. The roads into the Columbine FR1509 and Grapevine FR1508 areas would be closed, re-contoured, re-vegetated and restored to a natural condition with natural drainages reopened. Dispersed recreational use of Grapevine and Columbine for bird watching and hunting would likely increase once the area is returned to natural condition as the area would then provide additional cover, forage and water for birds and game and the absence of occupied structures would make hunting in the area legal.

Remaining recreation residences in compliance with existing permit conditions at the time of permit expiration would be issued a new special use permit with a term of ten years beyond the decision date not to re-issue special use permits. After the last recreation residence and associated improvements have been removed, all parking areas and access roads except FR 3207 would be re-contoured and restored to a natural condition. Forest road 3207 accessing lower Camp Creek would be gated and closed to public motorized access. Public pedestrian access for general dispersed recreation would be allowed within the recreation residence tract, and the area would experience an increased dispersed recreational use of hiking, picnicking and bird watching along Camp Creek.

In the short-term, opening Grapevine and Columbine to the general public by not allowing reconstruction would result in a small increase in dispersed recreation enjoyed by the general public. In the long-term, after all improvements are removed from Camp Creek and the area is returned to a near natural condition, there will be a large increase in the use and enjoyment of the area and the general public would be greater served.

In the short term, the No Action alternative would not affect existing commercial outfitter and guide operations. In the long term, ten years after all recreation residence improvements are removed; the area would then be available for commercial outfitter and guide use as well as commercial photography.

Indicator: Relative amount of available and desirable riparian based interpretation and dispersed recreation opportunities = in the short term Medium, long term High.

Alternative 2 - Proposed Action

Direct and Indirect Effects

This alternative proposes to renew 43 recreation residence term special use permits for a 20-year period. This alternative includes rebuilding of the ten residences that were burned in the Cave Creek Complex Fire of June 2005. The short-term effect under the Proposed Action alternative would be increased noise, traffic and visual impacts associated with the construction of the ten recreation residences. Recreation access and travel management could be affected in the analysis area during construction. Recreational scenic viewing opportunities could be affected. Short-term negative effects include viewing re-construction activities. Increased traffic on FR 24 associated with construction activities could minimally affect commercial outfitter/guide operations as well as other traffic using FR 24.

With exception of the recreation residence owners and their guests, there will be limited dispersed recreation opportunities for the general public within the recreation residence tract under this alternative.

Indicator: Relative amount of available and desirable riparian-based interpretation and dispersed recreation opportunities = Low.

Alternative 3 – Restoring Floodplain and Riparian Area Functions and Values

Direct and Indirect Effects

In this alternative all recreation residences and associated constructed features located within the 100-year flood plain of Camp Creek and its tributaries would be removed no later than ten years from the date of the decision. Ten-year permits would be issued for lots where the residence is inside the 100-year floodplain and in compliance with federal, state and county regulations. Twenty-year permits would be issued for lots where the residence is outside the 100-year floodplain and in compliance with federal, state and county regulations. Burned recreation residences in Columbine and Grapevine would be allowed to rebuild under a 20-year permit as long as no structures are built or maintained in the 100-year flood plain. The proposed action alternative would continue to meet the ROS standards for Roaded Natural areas.

With exception of the recreation residence owners and their guests, there will be very limited dispersed recreation opportunities for the general public within the recreation residence tract under this alternative. Although 15 recreation residences are removed under this alternatives it should not significantly change dispersed recreation alternatives.

Indicator: Relative amount of available and desirable riparian-based interpretation and dispersed recreation opportunities = Low

Cumulative Effects

Past, present, proposed and reasonably foreseeable activities were reviewed to determine cumulative effects to the recreation, lands and minerals resources.

Past activities include the Cave Creek Complex Fire (2005), post-fire flood events, recreation activities, and the St. Clair grazing allotment.

Current activities include work on FR 24, Western Area Power Authority power line, Cartwright grazing allotment, and recreation use.

Reasonable foreseeable future actions include paving FR 24 to Columbine Springs Wash and increased recreational use due to improved access and the increasing population of the Phoenix metropolitan area.

The Cave Creek Complex Fire impacted recreation residences in Camp Creek. Thunderstorms following the fire resulted in flooding and damage to water systems, homes, outlying structures, and bridge crossings. Flood frequency and severity are expected to decline as watershed conditions recover.

With the exception of recreation traffic passing through the tract on FR 24, recreation use by the general public within the tract is relatively light since roads to the recreation residences were gated which historically precluded public access of the area. Forest Road 24 is the primary road used to access portions of the district west of the Verde River. The road has been in existence since the 1930s and plans are underway to pave FR 24 to Columbine Springs Wash to meet Maricopa County air quality standards. Traffic through the tract on FR 24 and demand for dispersed recreational use by the general

public within the tract will increase in all alternatives with increasing population of greater Phoenix metropolitan area and possible future improvements to FR 24.

The St. Clair grazing allotment borders the Lower Camp Creek recreation residences and is no longer grazed. The Cartwright Allotment borders the Middle and Upper Camp Creek recreation residences and the Grapevine Spring Wash and Columbine Spring Wash residences. This allotment is not currently grazed. When the allotment is restocked, livestock will continue to be excluded from the recreation residence area and is not expected to greatly impact recreational use of the tract under any alternative.

The Western Area Power Authority 345 KV power transmission line, east of Camp Creek has little effect on the recreation resource with the exception of a slight visual impact. Maintenance to the line has been minimal and periodic helicopter flights are made along the line to check for maintenance issues.

Urban development and various recreational uses are most notable along FR 24 through the analysis area. Recreation activities such as trail use, camping, forest product gathering, hunting; scenic viewing, bird watching, driving for pleasure, and picnicking may be affected on a short-term basis in all listed alternatives. Forest recreation visitors would possibly be displaced to other areas of the forest or adjacent lands during the course of project activities in order to mitigate safety and liability concerns in the project areas. This short-term displacement of forest visitors has the potential for increasing impacts to other recreation sites and areas on and off the Tonto National Forest. However, there is no definitive means to measure these impacts. Any conclusions drawn from this displacement would be speculation and hypothetical in nature.

Many dispersed recreational opportunities for the general public could improve under alternatives that eliminate all or some of the recreation residence constructed improvements, including, trail use, and interpretive and scenic viewing. Long-term, as vegetation begins to regenerate, the potential for visual impacts would reduce. Overall, over the next ten years, recreation access via Forest system roads within the analysis area should remain unchanged under all alternatives as many of the roads in the area are closed to the general public with locked gates. Cumulative effects to all recreation opportunities, based on the areas proposed present and future, would be minimal for the next 10-years. After 10-years under the no action the recreation residences would be removed and recreational access and use of the area by the general public would increase.

3.3 Social and Economic Analysis

Affected Environment

Analysis Area

The Analysis Area for direct and indirect effects is the 873-acre area currently occupied by the Camp Creek Recreation Residence tract containing 44 recreation residence lots. This is the area that includes the population most affected by the proposed actions. The Analysis Area for cumulative effects is the larger Phoenix metropolitan area where the majority of the recreation residence permit holders and area visitors permanently reside. A history of the tract is presented in the Recreation, Lands and Minerals section of this chapter.

Demographic Patterns of Larger Phoenix Metropolitan Area with Relation to Camp Creek Recreation Residence Tract

The majority of Camp Creek Recreation Residence permit holders live in the Phoenix metropolitan area. Census data record the residences as seasonal and do not include information about any residents. While not a perfect measure of principal residence, we used zip codes for permit holder mailing addresses to derive a picture of where permit holders make their principal homes. Thirty-six (84 percent) out of the 43 permit holders reside within the Phoenix metropolitan area (within Maricopa County). Thirty-seven (86 percent) reside within Arizona.

Table 3-1. Permit Holder's Mailing Zip Codes, Travel Miles to Recreation residence, and Estimated One-Way Trip Time

ZIP CODE	Miles from Recreation residence	Minutes from Recreation residence	Number of Permit Holders in Zip Code
85331	10.9	35	5
85327	13.9	34	1
85373	16.1	60	1
85377	16.1	28	5
85335	24.3	67	2
85351	29.6	63	1
85326	30.5	84	1
85213	30.5	62	1
85253	32.3	56	1
85257	34.2	54	1
85254	36.2	47	1
85260	37.6	44	2
85251	39.8	54	1

ZIP CODE	Miles from Recreation residence	Minutes from Recreation residence	Number of Permit Holders in Zip Code
85022	39.8	51	1
85008	39.9	60	1
85007	40.3	64	3
85018	44.3	61	1
85014	44.9	57	1
85004	46	63	1
85032	46	48	2
85016	47.5	57	2
85281	70.2	59	1
85653	131.4	141	1
80218	594.3	761	2
65608	821.8	1197	1
97701	1101.6	1107	1
75070	1154.3	991	1
81428	1345.2	605	1

Table 3-2. Miles from Principal Residence

Miles from Principal Residence			
Population Mean	165.2	Median	39.5
Standard Deviation	343.2	Mode	10.9
Mean AZ	34.1	Median	34.2
SD AZ	21.8	Mode	10.9

Table 3-3. Minutes from Principal Residence

Minutes from Principal Residence			
Population Mean	171.3	Median	57
Standard Deviation	309.4	Mode	35
Mean AZ	52.6	Median	54
SD AZ	20.6	Mode	35

Since 1930, the Mountain West has more than doubled its share of the U.S. population, growing from three percent to 6.5 percent. The last 40 years have exhibited patterns of alternating decades of intense growth followed by decades of slower growth. Since the 1940s, Arizona has grown from 120,000 residents to more than five million (Socio-Economic Assessment for the Tonto National Forest, 2005: 4). Since 1920, Maricopa County (Table 3-4) has grown in population from less than 90,000 to about 3.75 million. In that time population density has increased from 10.2 to 408.5 people per square mile.

Within the County, housing units per square mile increased from 5.6 in the 1940 Census to 162.2 in 2006.

Population in the County is concentrated close to the intersections of Interstate Highway (I)-10 and I-17 and along the US-202 and US 60-corridors. County growth over the years has progressed from central Phoenix outward (see “Growth of Recorded Subdivisions in Maricopa County 1905-2007,” at <http://www.maricopa.gov/assessor/gis/growthslides.asp>).

The growth of subdivisions adjacent to the Forest boundary in the northeast part of the metropolitan area did not really start until the 1950s and 1960s. The first development adjacent to the National Forest in this area was Tonto Hills Subdivision (patented in 1932 and subdivided in 1961). Homes in Tonto Hills now often sell for more than \$700,000. Development in this and other adjacent to forest communities began in earnest in the late 1980s and 1990s at the same time that much of the pre-existing urbanized areas in were in-filled. Clearly, the privately held areas closest to the Camp Creek tract have change substantially since the Forest Service first authorized recreation residence use in the area. Past land exchanges in the 1960s (what is now Desert Mountain development) and 1980s (southeast of the intersection of Cave Creek and Bartlett Dam Roads) enabled private holdings to grow adjacent to the Forest.

Table 3-4. Demographic Information - Maricopa County (Census 1920-2006)

Census Year	Total County Area	Population	Population Density/ sq. mi.	Housing Units	Housing Units/ sq. mi.
2006	9,224	3,768,123	408.5	1,496,123	162.2
2000	9,224	3,072,149	333.1	1,250,231	135.5
1990	*9,175	2,122,101	231.2	952,041	103.8
1980	9,127	1,509,175	165.3	599,726	65.7
1970	*9,080	971,228	107.0	318,714	35.1
1960	*9,035	663,510	73.4	211,865	23.5
1950	*8,985	331,770	36.9	96,497	10.7
1940	*8,940	186,193	20.8	50,455	5.6
1930	8,891	150,970	17.0		
1920	*8,800	89,576	10.2		

* acreage projected

Maricopa County Association of Governments (MAG) has developed population projections for municipal planning areas in the County and maps indicating where the expected growth will occur. The incorporated communities closest to the Camp Creek tract are Carefree, Cave Creek and northern Scottsdale (Scottsdale covers a large geographic area, not all of which can be considered adjacent to the Camp Creek area). MAG planners expect Cave Creek to nearly double in size between 2005 and 2030. Carefree is expected to grow by 67 percent (Table 3-5).

Table 3-5. Total Resident Population by Municipal Planning Area, Current & Projections

Municipal Planning Area	Total Resident Population			
	2005	2010	2020	2030
Cave Creek	4,845	5,781	7,815	9,656
Carefree	3,654	4,418	5,816	6,097
Scottsdale	234,515	249,341	269,266	286,020
All County Total	3,681,025	4,216,499	5,230,300	6,135,000

Source: MAG, May, 2007

Geographic expansion of these communities is limited by open space designated in state, county and municipal parks and preserves and well as by adjacent development and National Forest System land. There is still some room for communities and housing density to increase toward the Forest boundary, but MAG does not foresee substantial community expansion in these areas. MAG Planners expect most County community expansion along I-17, and adjacent to and within Surprise, Buckeye and Goodyear in the west valley.

Economic Patterns with Relation to Camp Creek Recreation Residence Tract

Nationwide Patterns

The Economic Impact Committee of the National Forest Homeowners Association (NFH) conducted an on-line survey, the "Economic Impact of the Recreation Residences Program," among their members. The intent was "...to be able to demonstrate the value of the Forest Service Recreation Residence program to those who might wonder about the role of the recreation residence program in the 21st century (NFH Report, April 15, 2007: 1)." The Forest Service reports a recreation residence count of 13,940 nationwide. Those responding (128 or 1 percent) to the survey come from 90 different tracts in 39 different National Forests in 11 states (NFH Report: 2). Only three respondents own recreation residences in Arizona (Pete Bailey, personal communication, 11-2007). Since the surveyed permit holders were self-selected, and some areas were under-represented in the sample, the study's statistical validity may be in question. However, it's the best information we have.

NFH analysis of survey results indicated that the typical recreation residence owner spends approximately \$16,371 per year on their recreation residence. This figure includes an average federal land use fee of \$869; improvements and repairs (\$2246); travel to and from (an average of 205 miles one way at \$.445 per mile) the recreation residence; an average of 19 visits each year (occupied 66 days per year). The survey defines the local economy as within 50 miles of the recreation residence site and concludes that the impact of the recreation residence program on local economies is significant (NFH Report: 3). Local expenditures (food, staples, improvements and repairs, recreational activities, donations (\$549)), and volunteer hours (56 annually) for the typical recreation residence are approximately \$8,155 annually. Since we do not know the size of the local economies potentially impacted, the actual significance of local expenditures in the local communities is a question. Nevertheless, in the NFH study, permit holders do spend money locally in adjacent forest communities.

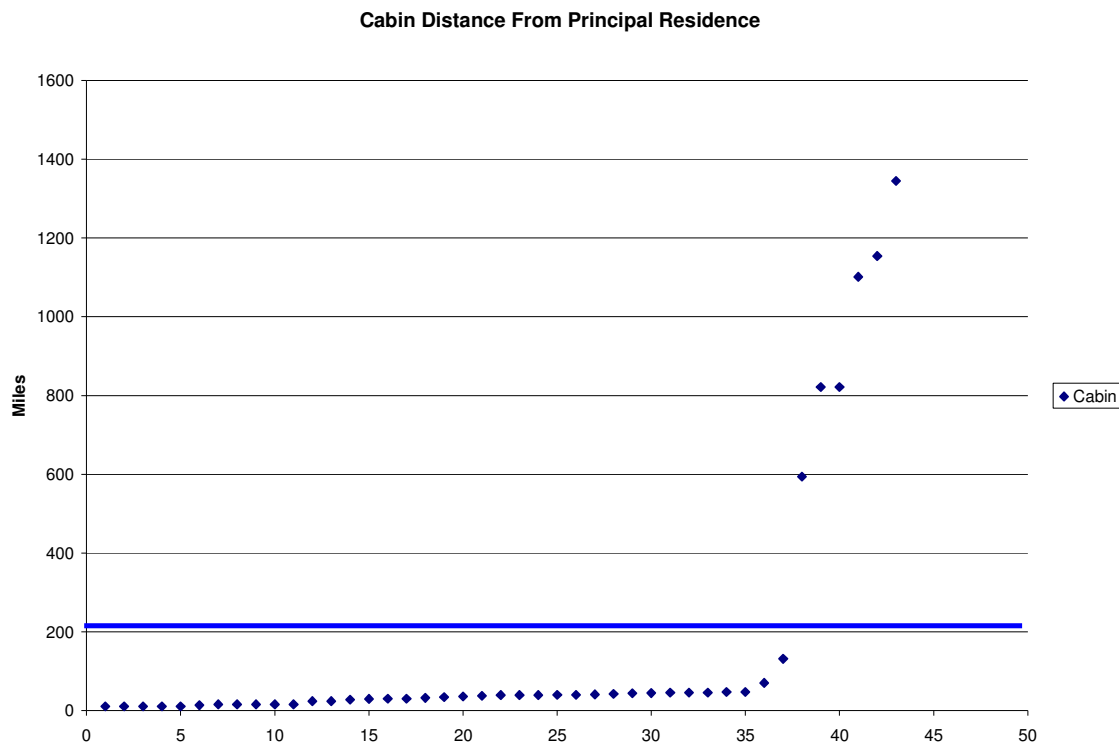
The NFH study estimates that the US Treasury receives \$12 million each year in special use fees for recreation residences nationwide. This \$12 million is not considered in the formulation of the Forest Service allocation and the agency does not derive any direct budget benefit from this money.

Local Patterns

The Carefree and Cave Creek communities are basically residential areas with heavy emphasis on resort-style living (AZ Dept of Commerce, 2007). Tourism and seasonal residents are important drivers of the economy and there is great dependence on the economy of the broader Phoenix urbanized area (Rex 2004: 1, 6). As one might expect in communities with economies dependent on tourism and resort sectors, much employment (92% above the average per capita relative to the nation and 70% above the average for the State of Arizona) is in accommodations and food services. The arts, entertainment and recreation sector and the construction sector are also well above the National and State averages (Rex 2004: 4). In 2006, Carefree reported \$111.9 million in taxable sales and Cave Creek reported \$162.9 million.

The information we have regarding the Camp Creek recreation residence owners indicates that use of the Camp Creek Recreation Residence tract may be significantly different than recreation residence tract use around the country. Table 3-1 and Figure 3-1 show that for the 86 percent of the recreation residence owners who reside in Arizona, their average one-way trip to their recreation residence is 34 miles and takes approximately 53 minutes. Within one standard deviation the variation is between 22 and 56 miles, still well below the 204 mile average (blue line on Figure 3-1) shown in the NFH study.

Figure 3-1. Camp Creek Recreation Residence Distance from Principal Residence



If one includes the 14 percent who are statistical outliers [those permit holders who reside more than one standard deviation (343) from the mean (165)] in the full Camp Creek population, the travel distance for the Camp Creek population still comes in well below the 204 miles national average. It may not be useful to consider the time for travel for out-of-state recreation residence owners, since it is possible that they would select other modes of transportation besides the automobile for travel to Arizona.

The NFH study considered the area within 50 miles of recreation residences as the “local economy” of the recreation residence tracts studied. For most permit holders in Camp Creek a 50-mile radius would include both their recreation residence and their primary residence. Thirty-five (81%) of the Camp Creek recreation residence owners appear to live within 50 miles of their primary residence. While we can expect some expenditure in Carefree and Cave Creek when permit holders visit their recreation residences, it is not likely that a large percentage of annual recreation residence expenses are spent in these local communities. If it is assumed, as in the NFH study, that permit holders buy food, drink and staples (\$4045), dine out (\$1171) and invest locally on improvement and repairs (\$2246) of their recreation residences, then each permit holder would spend about \$8,800 per year in Cave Creek and Carefree. Multiplied by 43 recreation residences, this would total \$378,529 expenditures locally per year (0.14% of the \$274.8 million in taxable sales in Carefree and Cave Creek each year).

Camp Creek Recreation Residence permit fees in calendar year 2007 were \$939.94. For 43 recreation residences, that brought \$40,417.42 into the Treasury. The Tonto National Forest has not kept records of administrative costs associated with managing recreation residence permitted use.

Environmental Consequences

Tonto NF engineers calculated a general budget for removal of recreation residences and rehabilitation of the lots (Brennan, 2007). The engineer’s report assumed that nothing had yet been removed and that all lots contained the same features. Lots with burned structures are expected to cost permit holders \$63,972 to rehabilitate. Lots with existing structures are expected to cost permit holders \$68,662 for complete rehabilitation.

Alternative 1 – No Action

Direct and Indirect Effects

Under this all burned home lots (11) would be rehabilitated immediately. The remaining (33) homes would have ten years within which to remove and rehabilitate the area.

Using the 2007 fee (\$939.94) for our calculations, the fee collections per year would go from \$40,417.42 down to \$31,018.02. After ten years the fee collection would be \$0. Since the \$40,417.42 did not represent a significant portion of the federal budget and will not have a negative effect on the local Tonto NF budget, the effect of this change will be negligible.

Rehabilitation of the 11 burned lots is expected to cost permit holders a total of \$703,692. Removal of the 33 lots with existing homes will cost \$2,265,841 in today’s dollars.

Cumulative Effects

Past, present and reasonably foreseeable activities were reviewed to determine cumulative effects to the social or economic environment. The Phoenix metropolitan area has experienced extraordinary growth over the last few decades. When portions of 7 Springs Road were paved, the Camp Creek Recreation Residence tract was brought closer to “civilization” than it has ever been in its 80-year history. The permit holders average a one-way trip of 34 miles (53 minutes) from their homes. This characteristic of the Camp Creek Recreation Residence tract makes it different from most recreation residence tracts in the nation. Impacts of the tract on the local economy or community are negligible.

Alternative 2 – Proposed Action

Direct and Indirect Effects

Under this alternative the Forest Service would allow all permit holders whose home were burned to rebuild. Existing home lots and burned home lots would be reauthorized for 20 years.

Using the 2007 fee (\$939.94) for our calculations, the fee collections per year would be \$40,417.42. The \$40,417.42 addition to the Treasury does not represent a significant portion of the federal budget. It will have no effect on either the local Tonto NF budget or a perceptible effect on the county or local government coffers.

Cumulative Effects

Past, present and reasonably foreseeable activities were reviewed to determine cumulative effects to the social or economic environment. The Phoenix metropolitan area has experienced extraordinary growth over the last few decades. When portions of 7 Springs Road were paved, the Camp Creek Recreation Residence tract was brought closer to “civilization” than it has ever been in its 80-year history. The permit holders average a one-way trip of 34 miles (53 minutes) from their homes. This characteristic of the Camp Creek Recreation Residence tract makes it different from most recreation residence tracts in the nation. Impacts of the tract on the local economy or community are negligible.

Alternative 3 – Restoring Floodplain and Riparian Area Functions and Values

Direct and Indirect Effects

Under this alternative, all burned homes would be rebuilt except those that are in the flood plain. Of the existing homes, 15 are within the 100-year floodplain and would be removed and their lots rehabilitated. They would have ten years within which to remove and rehabilitate their areas.

Using the 2007 fee (\$939.94) for our calculations, the fee collections per year would go from \$40,417.42 down to \$25,378.38 for the remaining 27 homes. Since the \$40,417.42 did not represent a significant portion of the federal budget and will not have a negative effect on the local Tonto NF budget, the effect of this change will be negligible.

Rehabilitation of the one burned lot is expected to cost the permit holder \$63,972. The 15 lots with existing homes will cost \$1,029,930 in today's dollars.

Cumulative Effects

Past, present and reasonably foreseeable activities were reviewed to determine cumulative effects to the social or economic environment. The Phoenix metropolitan area has experienced extraordinary growth over the last few decades. When portions of 7 Springs Road were paved, the Camp Creek Recreation Residence tract was brought closer to “civilization” than it has ever been in its 80-year history. The permit holders average a one-way trip of 34 miles (53 minutes) from their homes. This characteristic of the Camp Creek Recreation Residence tract makes it different from most recreation residence tracts in the nation. Impacts of the tract on the local economy or community are negligible.

3.4 Water Resources

Introduction

This section analyzes the direct and indirect effects to water resources of implementing the proposed action or alternatives to issue special use permits for continued location of recreation residences in the Cave Creek Ranger District of the Tonto National Forest.

Analysis Area

The analysis area for water resources encompasses the Camp Creek watershed above the most downstream recreation residence. This is an area of about nine square miles and includes the Camp Creek and Rackensack Canyon watersheds (see Figure 1-3).

A larger watershed area is necessary to assess the regional significance of Camp Creek. Other streams with reaches of perennial flow within the vicinity of Camp Creek include 7 Springs Wash, Cave Creek, New River, Lime Creek and the Verde River. These perennial stream reaches are located within the five US Geological Survey delineated 5th code watersheds found in the Southwestern corner of the Cave Creek Ranger District. Total area of the five watersheds lying within the boundaries of the Tonto National Forest is 202,503 acres.

Analysis Methods

Floodplain mapping was completed for the reaches of Camp Creek, Columbine Springs Wash, Grapevine Springs Wash and Rackensack Canyon that include the recreation residences. Floodplain mapping identifies areas inundated by the 100-year flood (the flood which has a one percent or greater chance of occurrence in any given year). It also identifies the regulatory floodway (the channel and adjacent land areas necessary to discharge the 100-year flood without cumulatively increasing the water surface elevation of the flood by more than one foot).

Topographic surveys included ground surveys conducted by Forest Service and contract personnel of finished floor elevations of the recreation residences and other structural features associated with the recreation residences (e.g., residence foundations, retaining walls, gabions, and roads). Aerial surveys to complete the topographic mapping were completed to provide one-foot contour interval maps of the recreation residence area.

An assessment of pre-disturbance topography in the recreation residence area was developed using the best professional judgment. The impacts of removing structures in the floodplain on flood flow characteristics (water surface elevation, flow velocity, and flood width) are evaluated by comparing the existing channel and floodplain topography with the estimated pre-disturbance topography.

Water surface elevations of the 100-year flood were evaluated with the structural features that currently exist. Removing the retaining walls, and fill stored behind the retaining walls, on a number of the lots would increase the area available for passing flood flows and may affect the water surface elevation of the 100-year flood. If the water surface elevation of the flood is reduced, residences currently identified as within the floodplain may no longer be within the area inundated by this flood. At other sites removal of retaining walls and other structures encroaching on the floodplain where the residence itself is not within the area inundated by the 100-year flood may remove the structural support needed for the stability of the residence.

Stream channel conditions in Camp Creek were assessed using the Rosgen (1996) stream channel classification system. This method requires collection of stream channel cross section and slope data and information about the particle sizes of the bed and bank materials that form the channel. Knowledge about the characteristics of the stream classes can be used to make inferences about stream channel stability and channel processes.

Affected Environment

Watershed

The Camp Creek watershed is located in the Arizona Upland subdivision of the Sonoran Desert Ecoregion. Physiographically, it lies within the Transition Zone, which separates the high desert of the Colorado Plateau from the isolated mountain ranges and large alluvial valleys of the Basin and Range physiographic province. Camp Creek flows generally from north to south through the watershed to its confluence with the Verde River below Bartlett Reservoir. Elevation ranges from a high of 5000 feet at Kentuck Mountain to a low of 1600 feet at the confluence with the Verde River. Average elevation at the recreation residences is about 3300 feet. The main stem of Camp Creek lies primarily in a narrow valley bottom confined by conglomerate bedrock in the upper reaches of the creek and intrusions of igneous bedrock in the lower reaches of the recreation residence area. Sinuosity (stream length/valley length) is low due to the structurally controlled landscape. Channel gradient (slope) averages about 2.7 percent (Nelson, 2005).

Climate is semiarid and is characterized by hot summers and mild winters. Precipitation occurs primarily during two seasons. The summer monsoon season generally occurs from July through September when moisture sweeps into Arizona from the Gulf of Mexico. These rains are characterized by short duration, often intense, localized thunderstorms. Winter precipitation results from westerly winds that bring storms from the Pacific Ocean and occurs from December through March. Winter precipitation generally occurs as gentle frontal systems that bring primarily rain but can include snow. July and August are the wettest months. May and June are the driest. Average annual precipitation is about 15 inches per year with about 55 percent occurring from October to March (Sellers and Hill, 1974).

The recreation residences are situated along the main stem of Camp Creek and along two small spring-fed tributaries to Camp Creek; Columbine Springs Wash and Grapevine Springs Wash. Columbine Springs Wash is a tributary to Camp Creek upstream of the Upper Camp Creek recreation residences. Grapevine Springs Wash is a tributary to Camp Creek within the Middle Camp Creek recreation residences. The Upper and Middle Camp Creek recreation residence areas as well as Recreation residences ten and 11 in the Lower Camp Creek recreation residence area are located along Camp Creek above the confluence with Rackensack Canyon. Recreation residences 32 and 55 are located at the confluence of Camp Creek and Rackensack Canyon. The remaining recreation residences are located along the main stem of Camp Creek below the confluence with Rackensack Canyon. The contributing area of the watershed above the recreation residences is displayed in the table and figure below.

Figure 3-3. Map of Camp Creek Watershed

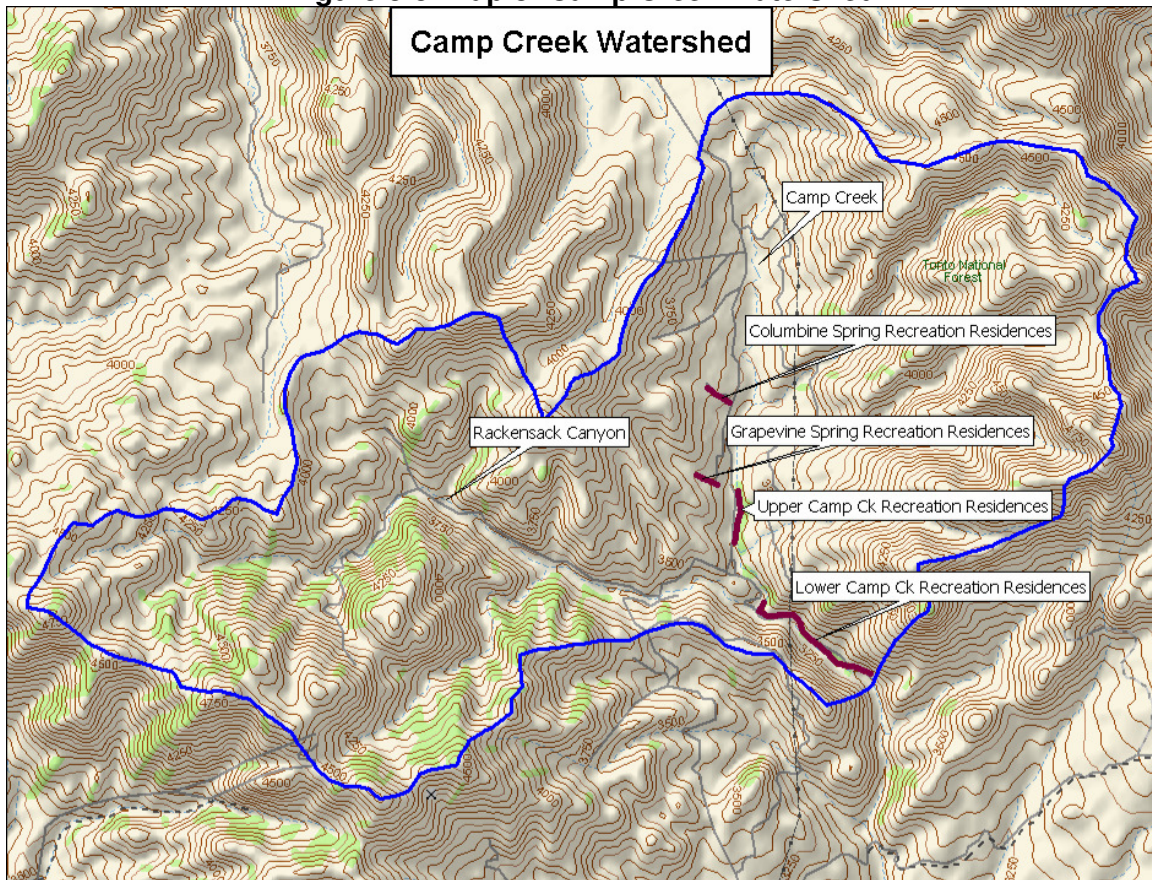


Table 3-7. Camp Creek Recreation Residences Watershed Area

Watershed	Contributing Area (square miles)
Camp Creek above residences	4.1
Camp Creek at Rackensack Canyon	4.6
Rackensack Canyon	4.2
Camp Creek Below Rackensack Canyon	8.8
Camp Creek at lowest residence	9.2
Columbine Springs watershed	.1
Grapevine Springs watershed	.2

Semi-desert grasslands are the dominant vegetation type covering 43 percent of the area. Chaparral dominated by turbinella oak covers about 20 percent of the area while more open turbinella oak and redberry juniper chaparral woodland covers 13 percent. Open redberry juniper woodlands with a grassy understory cover 16 percent of the area. Sonoran Desert scrub covers seven percent of the area, while riparian vegetation covers less than one percent.

Watershed conditions in the Camp Creek watershed were altered by the 2005 Cave Creek Complex Fire, which burned most of the watershed above the recreation residences. Burn severity in the Camp Creek watershed is displayed in the table below.

Table 3-9. Camp Creek Watershed Burn Severity

Burn Severity	Acres	Percent
Unburned	285	5
Low	2,277	39
Moderate	3,348	57

Burned watersheds in the Southwest are prone to enormous peak flow increases due to interactions of fire regimes, soils, geology, slope, and climate (Neary et al, 2003). Intense short duration storms in association with fire altered watershed conditions are responsible for much of the large increases in stream peak flows (Neary et al, 2003). Large post-fire runoff events have been observed in Camp Creek since the Cave Creek Complex Fire. A storm on September 3, 2005, triggered high flows in Camp Creek, which resulted in flooding of some recreation residences and bank erosion at others. Other storms in the watershed following the Cave Creek Complex Fire have also caused flooding and erosion problems among the recreation residences. The increase in peak flows resulting from burned watersheds normally declines rapidly following fire with most of the increase declining during the first three to five years (Baker, 1990).

Erosion and sediment yield can also increase dramatically following fire. Incision and widening of stream channels can occur in some channel reaches from bed and bank erosion while sediment deposition and channel aggradation can be occurring in other reaches of the same stream in areas where sediment transport capacity is reduced. Evidence of both of these processes is present in Camp Creek through the recreation residence area.

Floatable debris was cleared from the channel of Camp Creek following the Cave Creek Complex Fire as an element of the Burned Area Emergency Response (BAER) Plan developed to respond to emergency conditions created by the fire. Other measures implemented to reduce the threat of post fire flooding included; some removal of vegetation in the channel, sand bagging of vulnerable residences, and additional bank protection at some locations. The Flood Control District of Maricopa County has also installed two Alert System rain gages to provide warnings about flash flood conditions. One gage was installed at the watershed divide between Camp Creek and 7 Springs Wash immediately after the fire and a second was recently installed in Rackensack Canyon.

Water Resources

Water resources in the analysis area include the perennial reach of Camp Creek that begins near the uppermost recreation residence on the main stem of Camp Creek (Recreation residence 47), and flows nearly continuously through the recreation residence area for a distance of approximately 1.5 miles. Total length of the perennial flow reach is about 3.5 miles. Other water resources include several springs that surface in Sycamore Canyon (a tributary to Camp Creek above the recreation residence area) and in the Rackensack Canyon watershed. Three major springs discharge within the recreation residence area and are valuable water supply sources for the residents. These include Columbine Spring, which provides water to the 12 residences along Columbine Springs Wash and Upper Camp Creek, Grapevine Spring that provides water to the four residences along Grapevine Springs Wash, and Kentuck Spring, which surfaces next to the main stem of Camp Creek across from Recreation Residence 4. Kentuck Spring provides domestic water to the 28 residences in Middle and Lower Camp Creek. It also adds substantially to the flow in Camp Creek. Columbine Spring and Grapevine Spring support short reaches of perennial flow that in turn supports aquatic and riparian habitat. Perennial flow in Camp Creek also supports valuable aquatic and riparian habitat. Diversions from Columbine and Grapevine Springs have been reduced due to destruction of most of the residences served by these springs during the Cave Creek Complex Fire. The only residences that continue to be served by Columbine Springs are the seven residences in the Upper Camp Creek reach. All of the residences served by Grapevine Springs were destroyed in the fire and the spring development has been damaged by post fire flooding.

In terms of regional significance, the total length of perennial streams on National Forest System lands within the five watersheds of the southwestern corner of the Cave Creek Ranger District (excluding the Verde River) is 20 miles. The perennial stream reaches are displayed in the table below.

Table 3-10. Perennial Streams

Stream Flow	Tonto National Forest Flow Length (miles)
Camp Creek	4
7 Springs Wash	1
Cave Creek	8
Lime Creek	5
New River	2
Total	20

Perennial streams and the riparian areas these streams support are a rare and valuable resource in the semiarid Southwest (Debano and Schmidt, 1989). The density of perennial stream reaches (excluding the Verde River) in the Cave Creek District watersheds is less than 0.1 mile per square mile. In contrast, the density of perennial stream reaches draining the Mogollon Rim is greater than .25 miles per square mile. The difference provides an illustration of the importance (due to its scarcity) of perennial water in the Sonoran desert. The 1.5-mile perennial reach of Camp Creek flowing

through the recreation residence area represents eight percent of the perennial stream reaches in the regional watershed area.

Median monthly flows in Camp Creek, collected at a site on the creek near the most downstream recreation residence over a period of six years, range from .05 cubic feet per second (cfs) in June to .30 cfs in March. Median monthly flows are displayed in the Table below.

Table 3-11. Camp Creek Median Monthly Flows (cfs)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flow	0.28	0.24	0.30	0.22	0.05	0.05	0.12	0.06	0.11	0.05	0.18	0.18

These flows support fish (including two species of native fish), other aquatic wildlife, riparian vegetation, and recreational uses of the creek. Total volume represented by these flows is about 111 acre-feet per year.

Water used for domestic purposes from the three springs that provide for the water needs of the tract is estimated at about 8,000 gallons per day based on water rights filings and inspection reports prepared for the water systems used by the tract. Using an average occupancy of six months per year water use for domestic purposes would require about 4.5 acre feet per year (4 percent of the annual flow volume). Some of the water used would return to the creek through percolation from septic systems.

Long-term drought conditions that began about 1996 have reduced spring discharge and stream flow in some locations in the Camp Creek watershed.

Stream Channel

Twenty-eight stream channel cross sections were surveyed in the recreation residence area. These cross sections have been used to classify channel reaches on the basis of Rosgen stream type. Based on the cross sections the channel consists primarily of “B” and “F” stream types. “B” stream types are moderately entrenched; they normally develop in narrow valley bottoms that limit the development of wide floodplains. They have cross section width and depth ratios of greater than 12, display low channel sinuosity, have moderate channel slopes (2-4 percent) and display “rapids” dominated bed morphology.

“F” stream types are deeply incised, have low entrenchment ratios (indicating little floodplain development), high width and depth ratios and bed form features occurring as riffle-pool sequences.

Channel dimensions that are constricted by rock, concrete, and gabion walls, and by excavated fill material result in the “F” stream type classification at several of the assessed reaches. “F” channels typically do not have properly functioning floodplains because flood flows are confined within narrow valley bottom, terrace or man-made walls. Under natural conditions flood flows in F type channels erode the confining bank and terrace features and result in widening of the channel until new floodplain features evolve. Eventually more stable channel conditions develop.

Channel assessments completed at two locations within the recreation residence area resulted in impaired channel condition ratings using the Tonto Stream Assessment Method (Mason and Johnson, 1999). The impaired rating results from unstable channel

conditions due to scouring and deposition of the bed and banks, low vegetative protection for the channel and floodplain and moderate to high bank erosion hazard. Recent scouring floods resulting from poor watershed conditions following the Cave Creek Complex Fire are probably responsible for much of the observed scouring and deposition apparent in the channel. The channel at the lower assessment site appears to have down-cut as a result of flooding following the fire. At the upper assessment site a very high width and depth ratio (wide and shallow) reduces the ability of the channel to transport sediment during periods of flooding and results in deposition of transported sediment.

Stream Crossings

Constructed low water crossings exist at four locations along Camp Creek. These crossings are located between residences 41 and 2 in Upper Camp Creek (crossing 1), below residence 32 on Rackensack Canyon (crossing 2), at residence 16 in Lower Camp Creek (crossing 3), and between residences 22 and 37 in Lower Camp Creek (crossing 4). Other stream crossings exist between Forest Road (FR) 24 and residence 33 in Middle Camp Creek, between FR 24 and Lot 29 in Middle Camp Creek, between residences 32 and 55 in Lower Camp Creek and to Lot 62 on Grapevine Springs Wash.

Crossings 1, 3 and 4 have created substantial changes in the channel bed elevation (3 to five foot drops) as the channel transitions from the upstream side of the crossing to the downstream side of the crossing. Sediment and bed load material has deposited upstream of the crossings and reduced channel gradients. The channel has down cut below crossings 3 and 4. The remaining crossings physically impact bank features and prevent development of riparian vegetation.

Water Quality

Water quality standards applicable to the state of Arizona do not specifically identify Camp Creek in the list of surface waters and designated uses published for the state (AAC Title 18, Ch 11, Article 1, Appendix B). The nearest downstream river segment identified in the standards is the reach of the Verde River below Bartlett Dam. Water quality standards for perennial or intermittent tributaries to listed stream reaches that are below 5000 feet are intended to protect the designated uses of aquatic and wildlife (warm water), full body contact and fish consumption (R18-11-105).

Water quality in Camp Creek has not been sampled by the Arizona Department of Environmental Quality (ADEQ) as part of its ambient water quality monitoring program. Many of the recreation residences rely on septic systems for disposal of sewage and grey water. Many of these systems are in close proximity to the stream. To assess the effects of these systems on water quality in Camp Creek the Forest Service conducted a water quality study of the creek from 1975 to 1977 (Leffert, 1977) and collected additional samples in 2006. The 1977 study collected samples at Kentuck Spring, at a low water crossing approximately two-thirds of the way through the recreation residence area and below the lower-most recreation residence. Samples were collected monthly from July 1975 to May 1977. Parameters sampled included fecal coliform as the primary bacteriological indicator, nitrogen-nitrate and orthophosphate as the primary indicators of nutrients, and other physical and chemical parameters including: alkalinity, calcium, total hardness, pH, sulfate, iron, conductivity, and temperature. The range and average values for selected constituents are listed in the table below.

Table 3-12. Camp Creek Water Quality Data 1975 – 1977

Constituent	Kentuck Spring		Low Water Crossing		Below Residences	
	Range	Average	Range	Average	Range	Average
Fecal coliform (colonies/100 mL)	0-500	32	0 - 2	1	0 - 1010	74
Nitrogen nitrate (mg/l)	.026 – 2.35	1.13	.02 - .2	.11	.02 - .84	.13
Orthophosphate (mg/l)	.25 - .98	.44	.125 - .13	.128	.02 - .95	.37
Total hardness (mg/l)	52 - 376	211	226 - 232	229	70 - 426	271
Total iron (mg/l)	.02 - .41	.09	.025 - .03	.03	.02 - .48	.1
Sulfate (mg/l)	6 - 15	8	6 - 7	7	1 – 37.5	11
Conductivity (µmhos/cm)	120 - 525	401	320 - 440	380	160 - 925	577
pH	7.1 – 7.7	7.3	7.9 – 8.0	7.9	7.2 – 8.5	7.7

Water quality during this sampling period was generally good. Fecal coliform counts ranged from 0 to 52 cfu/100 mL at the downstream sampling location during base flow conditions when discharge from septic systems would be most evident. The current standard for *E. coli* bacteria is a single sample maximum of 235 colony forming units per 100 milliliters for the full-body contact designated use. Spikes in fecal coliform counts occurred during periods of storm water runoff when the influence of septic systems would be minimal.

Nutrient concentrations (nitrate and orthophosphate) were greatest at Kentuck Spring and declined through the recreation residence area. Nutrient uptake by aquatic and riparian plants through the reach of perennial flow is probably responsible for the decline. Nitrate concentrations are well below the standard of 2,240 milligrams per liter for the full-body contact designated use. Phosphate standards do not exist for the designated uses of Camp Creek.

Water quality samples were collected in April of 2006 to again assess the potential effects of septic systems on Camp Creek. Samples were collected above Recreation residence 47, above Recreation residence 10 and below recreation residence 69. One sample was also collected at Kentuck Spring. Four samples were collected to test for the presence of fecal coliform at each of the stream sites. One sample was collected to test nitrate concentrations at each of the sites. Sample results are provided in the table below.

Table 3-13. Camp Creek Water Quality Data 2006

	Fecal Coliform MPN/100mL¹	Fecal Coliform Geometric Mean	Nitrate + nitrite - N mg/L as N	Nitrite-N mg/L as N
Upper Camp Creek	<1	<1	<.01	<.01
	<1			
	<1			
	<1			
Middle Camp Creek	14	11.3	<.01	<.01
	15			
	11			
	7			
Lower Camp Creek	<1	1.4	0.01	<.01
	2			
	<1			
	2			
Kentuck Spring	<1			

The water quality standard for *E. coli* bacteria for the full-body contact designated use is a geometric mean of 126 cfu/100 mL and a single sample maximum of 235 cfu/100 mL. The fecal coliform results indicate that bacteria concentrations are well within the standards. Nitrate concentrations are also well below state standards.

Many of the septic systems within the tract do not have Maricopa County permits. The potential for these systems to affect Camp Creek is unknown but may exist. Remnant pit toilets that could potentially affect water quality also exist in the tract.

Roads are a well-known source of sediment (Dissmeyer, 2000). Sediment can adversely affect water quality by increasing turbidity. Large increases in sediment can also adversely affect habitat for fish and aquatic macroinvertebrates (MacDonald, 1991). There are currently 1.7 miles of roads in the recreation residence area that provide access to the residences. Additional cleared areas exist for driveways and parking areas. These features discharge small amounts of sediment into Camp Creek during storm events. Vehicle crossings of live streams at low water crossings also generate short-term increases in turbidity.

Floodplains

Floodplains are the areas adjacent to the channels over which out-of-bank flows are diffused. The water moving over floodplains travels at lower velocity than channel flows. Reduced flow velocities result in sediment deposition that provides a medium for

¹ MPN = Most Probable Number of colony forming units (cfu)

recruitment and maintenance of riparian vegetation (UA, 2006). Growth of riparian vegetation helps stabilize banks and floodplains, dissipates flood flow energies, and improves percolation of water into floodplain aquifers. Water stored in alluvial floodplain aquifers is available for slow release into the channel and can help maintain or prolong base flows (Debano and Schmidt, 1989).

Maricopa County identifies the natural and beneficial values served by floodplains as including, but not limited to; natural flood and sediment storage and conveyance, water quality maintenance, groundwater recharge, biological productivity, fish and wildlife habitat, harvest of natural and agricultural products, recreation opportunities and areas for scientific study and outdoor education (Floodplain Regulations for Maricopa County, 2006).

The location of residences and other lot structures, particularly retaining walls and fills, in relation to flood elevations was assessed using standard methods recommended by the Federal Emergency Management Agency (FEMA) for floodplain delineation studies. The elevation of the obstruction created by each of the recreation residences in relation to the elevation of the 100-year flood are displayed in Table 3-14.

Table 3-14. Camp Creek Recreation Residences Floodplain Status

Residence Number	Cross Section Id	Obstruction Created by Residence Elevation	100-year Flood Water Surface Elevation	Obstruction Elevation Minus 100-year Flood Elevation	Residence within Floodplain	Outlying Structures within Floodplain	Outlying Structure Type
Columbine Spring Residences							
58	0.185	burned	3527.4	n/a	N	N	structure burned
57	0.173	burned	3522.5	n/a	N	Y	retaining wall
56	0.159	burned	3513.2	n/a	N	N	
53	0.141	burned	3490.0	n/a	N	N	
52	0.126	burned	3482.9	n/a	N	N	
Grapevine Spring Residences							
60	0.226	burned	3460.2	n/a	N	N	
61	0.208	burned	3450.1	n/a	N	N	
62	0.156	burned	3433.6	n/a	N	N	
63	0.137	burned	3428.3	n/a	N	N	water system structure in channel
Upper Camp Creek Residences							
47	16.539	3402.6	3404.5	-1.9	Y	Y	wall
47 Garage	16.524	3400.8	3401.8	-1.0	Y	Y	wall, road
42	16.509	3398.2	3399.6	-1.4	Y	Y	gabions, bank armor, wall, road
1	16.476	3396	3395.6	0.4	N	Y	wall, road

Residence Number	Cross Section Id	Obstruction Created by Residence Elevation	100-year Flood Water Surface Elevation	Obstruction Elevation Minus 100-year Flood Elevation	Residence within Floodplain	Outlying Structures within Floodplain	Outlying Structure Type
2	16.457	3393.2	3393.6	-0.4	Y	Y	wall, road
41	16.444	3390.5	3390.6	-0.1	Y	Y	wall
4	16.426	3387.6	3389.3	-1.7	Y	Y	wall, road, Kentuck Spr dvlpmt
5	16.417	3385.8	3387.5	-1.7	Y	Y	wall, road, Kentuck Spr dvlpmt
Middle Camp Creek Residences							
46	16.378	3384	3384.3	-0.3	Y	Y	wall, bridge pier?, road cut/fill
40	16.358	3379.5	3378.3	1.2	N	Y	structure burned, bridge piers
7	16.332	3381.7	3375.8	5.9	N	N	cut/fill?, FR24 fill
8	16.318	3379.4	3373.5	5.9	N	N	cut/fill?, FR 24 fill
9	16.305	3371.5	3372	-0.5	Y	Y	bridge pier, cut/fill?, FR24 fill
36	16.24	3362.5	3363.3	-0.8	Y	Y	gabion, bank armor
33	16.188	3354.4	3353.7	0.7	N	Y	driveway, low water xng, FR 24
30	16.112	3342.5	3344.3	-1.8	Y	Y	wall, patio, FR 24 fill
29	16.085	burned	3342.3	n/a	n/a	n/a	structure burned and removed
54	16.006	3332.7	3330.8	1.9	N	Y	wall

Residence Number	Cross Section Id	Obstruction Created by Residence Elevation	100-year Flood Water Surface Elevation	Obstruction Elevation Minus 100-year Flood Elevation	Residence within Floodplain	Outlying Structures within Floodplain	Outlying Structure Type
Lower Camp Creek Residences							
10	15.613	3270.0	3269.5	0.5	N	Y	Cut/fill
11	15.597	3270.0	3267	3.0	N	Y	bank armor, cut/fill
32 CC ²	15.561	3265.1	3263.2	1.9	N	Y	wall, road
32 RS ²	0.024	3265.1	3263.2	1.9	N	Y	wall
55	15.536	3263.4	3259.3	4.1	N	Y	wall, road
13	15.496	3251.2	3254.5	-3.3	Y	Y	cut/fill - wall
15	15.349	3239.5	3237.9	1.6	N	Y	walls for road and for lot
16	15.312	3229.9	3230.4	-0.5	Y	Y	gabions, walls, lower level of residence
19	15.224	3223.9	3219.6	4.3	N	N	road fill
67	15.082	3208.5	3203.2	5.3	N	N	
23	15.021	3195.0	3196.4	-1.4	Y	Y	bank armor, cut/fill, road cut/fill
24	15.009	3195.3	3193.6	1.7	N	Y	cut/fill-wall, road cut/fill
26	14.989	3197.5	3192.0	5.5	N	Y	Wall, cut/fill, road cut/fill
27	14.969	3195.8	3191.4	4.4	N	Y	walls, fill, road cut/fill

² CC refers to conditions at residence 32 along Camp Creek, RS refers to conditions at residence 32 along Rackensack Canyon.

Residence Number	Cross Section Id	Obstruction Created by Residence Elevation	100-year Flood Water Surface Elevation	Obstruction Elevation Minus 100-year Flood Elevation	Residence within Floodplain	Outlying Structures within Floodplain	Outlying Structure Type
28	14.953	3187.8	3188.0	-0.2	Y	Y	wall, fill, road wall, road cut fill
22	14.84	3170.3	3172.8	-2.5	Y	Y	wall, cut/fill, road
37	14.813	3171	3169.3	1.7	N	Y	bank armor, cut/fill, road cut/fill
45	14.813	3175.2	3169.3	5.9	N	N	road
69	14.763	3184.47	3162.2	22.22	N	N	

Source: JE Fuller Hydrology and Geomorphology Inc. 2007

The floodplain delineation study identifies 15 residences that lie within the area inundated by the 100-year flood (see Table 3-14). Many of the recreation residence lots contain other structural features such as retaining walls, gabions, bank armoring, and cut and fill features on which residences are constructed that also lie within the floodplain (see Table 3-14 above). Fourteen lots, in addition to those where the residence occupies an area inundated by the 100-year flood, contain other structural features that lie within the zone inundated by the 100-year flood.

Structural features that encroach into the floodplain constrict flood flows. The effects of these constrictions vary by location relative to the constriction. Constrictions that create backwater effects (a partial damming effect), result in reduced flow velocity, higher water surface elevations and reduced sediment transport capacity upstream of the constriction. Sediment and bed load deposition are more likely to occur at above normal levels at these sites due to reduced sediment transport capacity. At the site of the constriction, flow velocity, sediment transport capacity and water surface elevation are increased. Channel scouring is more likely to occur at these sites.

3.4.1 Environmental Consequences

Alternative 1 – No Action

Direct and Indirect Effects

During the 10-year permit period existing conditions would continue. Watershed conditions created by the Cave Creek Complex Fire should recover by the end of the 10-year permit period. Above normal peak flows resulting from fire degraded watershed conditions should also have returned to pre-fire levels. The scouring and deposition effects created by these flows will likely still be evident in the form of scoured and incised channels in some reaches and sediment and bar deposits in others.

Following the ten-year permit period removal of residences and other lot structures currently located within the floodplain would reduce the potential for flooding to impact human health and safety, and to cause property damage. Removing other structural features within the floodplain would also reduce the risk of flood losses to property within the floodplain.

Removing structures that encroach on the floodplain, and restoring the predevelopment channel and floodplain topography would restore natural floodplain functions and values. These include reduced flood flow velocities, sediment deposition, riparian recruitment and maintenance (which in turn stabilize channels and provides wildlife habitat) and percolation of flood flows into the floodplain alluvium and slow release into the channel (which helps to sustain base flows).

In the short term, removing structural features from the floodplain would result in increased flow velocities at some sites and reduced flow velocities at other sites. At sites where structures have created backwater effects (ponding), upstream flow velocities would be increased. At sites where flood flows have been constricted by structures, flow velocities would be reduced. Water surface elevations of flood flows would be reduced at most affected sites because backwater effects would be eliminated, and where constricting structures are removed, flood flows could spread out across the full width of the restored floodplain. The range and average differences in selected flood flow characteristics are displayed in Table 3-15 below. In the long-term development of riparian vegetation would provide greater resistance to flood flows and would be

expected to reduce the velocity of flood flows from those that occur immediately after structures are removed.

Table 3-15. Change in 100-year Flood Characteristics

	Water Surface Elevation (ft)	Stream Flow Velocity (ft/sec)	Flood Width (ft)
Maximum Increase	1.7	6.8	35
Maximum Decrease	2.9	4.0	19
Average Change	0.5 ft decrease	0.1ft/sec decrease	7 ft increase

The average flow depth of the 100-year flood under existing conditions is slightly more than 10 feet. The average decrease in flow depth of 0.5 feet under restored conditions represents about a five percent change from existing conditions, which is not a significant change. The average flow velocity of the 100-year flood under existing conditions is about 14 ft/second. The average decrease in flow velocity of 0.1 ft/second represents less than a one percent decrease in flow velocity, which is also not significant. The average width of the area inundated by the 100-year flood under existing conditions is slightly more than 80 feet. The average increase of 7 feet in the area inundated under restored conditions represents about a nine percent increase in the width of the 100-year floodplain. This change, while greater in magnitude than the other changes, is also probably not significant.

Effects of the presence or absence of structures and residences on flood flow characteristics vary by individual residences. Lots where removal of structures would cause the water surface elevation of the 100-year flood to decrease by more than 10 percent or result in an increase in the top width of the 100-year flood by more than 20 percent are listed in the table below.

Table 3-16

Effects of Individual Residences on Selected Flood Flow Characteristics

Lot Number	Percent Decrease in Water Surface Elevation	Percent Increase in Flood Width
47		47
47 Garage		24
42		21
2	14	
41	19	25
40		25
8		24
36		27
30		29
54		63
15	12	
24		32
27		33
22		37
37,45	25	

The 100-year flood is a large flood, estimated at nearly 4000 cfs in the upper reaches of Camp Creek and about 6200 cfs below the confluence with Rackensack Canyon. 100-year floods occur only infrequently, on average about once every 100 years. Floods of this magnitude typically have profound effects on the channel and adjoining floodplains. They scour floodplain vegetation, erode the bed and banks of the channel, and deposit eroded sediments and bed load materials on floodplain surfaces and within the channel itself. The result is removal of many riparian plants with survivorship primarily at the margins of the flood, by older flood resistant individuals, or by younger individuals that are flexible enough to be laid over by the force of the moving water. These effects would be similar regardless of the presence or absence of confining structures and residences.

The effects of the structures and residences on flood flow characteristics of more frequent floods such as the 10-year flood varies from the effects of the 100-year flood. The difference in water surface elevation from existing conditions to conditions with structures removed is less (on a percentage basis) from the 10-year flood but the difference in width of the area inundated is slightly greater (on a percentage basis) (12 percent versus 10 percent) from the ten-year flood than from the 100-year flood. More frequent floods such as the ten-year flood may have a greater impact on the diversity of riparian ecosystems than the 100-year flood. The more frequent floods scour floodplain

surfaces providing a seedbed for riparian recruitment but exerting a less damaging effect on existing vegetation than the 100-year flood. There would be a small beneficial effect from removing structures within the floodplain on the functions and values provided by these more frequent floods. Floodplain functions and values include providing a suitable site for recruitment and maintenance of riparian vegetation, flood flow dissipation, filtering of sediments, and recharge of alluvial aquifers.

Stream Channel

Restoration of channel and floodplain dimensions where structures are currently located is expected to result primarily in a “B” type channel under the Rosgen classification system through most of the recreation residence area. Gravel dominated, “B” type channels (“B4” channel types) are moderately sensitive to disturbance, but have excellent recovery potential (Rosgen, 1996).

Low Water Crossings

Removal of the three constructed low water crossings on Camp Creek would create head cuts that would create short reaches of incised channel. Bank erosion would be expected from newly incised channels until width/depth ratios and flood prone area widths typical of “B” type channels could be created at the newly lowered base level of the channel. Material eroded from newly incised channels would be transported downstream to areas of lower energy where it would be deposited as bar and sediment deposits. Reworking of these deposits by fluvial processes would occur until suitable stable channel dimensions were created. Fine sediments eroded from head cutting reaches would result. Recruitment of riparian vegetation at both sites (areas of incision and deposition) would help stabilize these areas.

Water Quantity

Removing the recreation residences would eliminate the domestic water uses of Columbine, Grapevine and Kentucky Springs. Eliminating the domestic uses of these springs would allow the full flow from these springs to remain in the channel (except for the diversion for stock use from Columbine Springs) downstream of the springs. Water use for domestic purposes, based on an average occupancy of six months per year, is about 4.5 acre feet per year or about four percent of the estimated annual flow volume of 111 acre feet per year (based on six years of monthly flow measurements). Restoring the full flow to these channels would result in a small increase in the water available for aquatic and riparian habitat.

Water Quality

Short-term increases in erosion and turbidity would be expected where structural features are removed. These effects would occur primarily during storm events and would decrease as the sites revegetate. Although impacts from septic systems have not been detected in water quality samples collected from Camp Creek, removal of these systems reduces the potential for bacteria and nutrient contamination in the creek.

Cumulative Effects

The cumulative effects of past, present, proposed and reasonably foreseeable future activities do not add significantly to the effects of this alternative.

Alternative 2 – Proposed Action

Direct and Indirect Effects

Peak flow and sediment yield increases resulting from the Cave Creek Complex Fire should recover to near pre-burn levels within three to five years from the date of the fire (Baker, 1990). Risk of flooding would be reduced as watershed conditions recover. However, 15 residences would continue to have finished floor elevations below the water surface elevation of the 100- year flood. The potential for floods to impact human safety, health and welfare at these residences would continue to exist. Many residences would continue to have other structural features associated with their lots, such as foundations, retaining walls, gabions, bank armoring and cut and fill features on which residences are constructed, located within the area inundated by the 100-year flood. These features as well as residences within the 100-year floodplain would continue to be at risk of damage from flooding.

Structural features located within the 100-year floodplain would continue to affect flood flows. Structures that create backwater effects would result in reduced flow velocities, higher water surface elevations and reduced sediment transport capacity upstream of the structure. Deposition of sediment and bed material where sediment transport capacities are reduced would continue to occur. Structures that constrict flood flows would continue to cause increased flow velocities, increased water surface elevations and increased sediment transport capacities through the constriction. Scouring of channel and structural features would continue where velocities are increased. On average these effects are small in terms of the 100-year flood but can be substantial at site specific locations. Table 3-16 displays the recreation residence lots that have the greatest effect on selected flood flow characteristics of the 100-year flood.

The natural functions and values of the Camp Creek floodplain would continue to be impaired where structural features intrude into the floodplain and floodway.

Water Quality

Turbidity and sediment from roads providing access to recreation residences would continue to enter Camp Creek during periods of storm water runoff. Small short-term impacts to turbidity would continue to occur when vehicles cross live stream channels at low water crossings.

Water Quantity

Water would continue to be diverted and used for domestic purposes from Columbine, Grapevine and Kentuck Springs. Water diverted and consumed for these purposes would continue to reduce water available below the springs and in Camp Creek.

Enforcement of the restrictions on outdoor watering and residency would reduce diversions from Columbine, Grapevine and Kentuck Springs to levels below those prior to the Cave Creek Complex Fire. Reconstruction of homes destroyed by the fire would result in water use that is greater than currently occurs.

Cumulative Effects

The cumulative effects of past, present, proposed, and reasonably foreseeable future activities are similar to those described under the No Action Alternative. Public recreational use of the tract would be lighter than under the No Action Alternative due to the public perception that the area is closed to public use. Cumulatively, the effects of all activities would not add significantly to the effects of this alternative.

Alternative 3 – Restoring Floodplain and Riparian Area Functions and Values

Direct and Indirect Effects

Table 3-14 identifies the residences and associated lot structures that encroach within the boundaries of the 100-year flood. These structures would be removed under this alternative.

Impacts of this alternative would be similar to Alternative 1. Fifteen residences lie within the area inundated by the 100-year flood. Thirty-one lots contain other structural features such as bank armor, retaining walls, cut and fill slopes and bridge piers that lie within the limits of the 100-year floodplain. In addition to structural features associated with individual lots, other constructed elements such as road surfaces, road cut and fill slopes and retaining walls, constructed low water crossings, power poles and check dams also lie within areas inundated by the 100-year flood.

Removing residences currently located within the floodplain would reduce the potential for flooding to impact human health, safety and welfare. Removing other structural features within the floodplain would also reduce the risk of flood losses to property within the floodplain.

Removing the structures that constrict flood flows, and restoring the predevelopment channel and floodplain topography would restore the natural functions of these features. These include reduced flood flow velocities, sediment deposition, riparian recruitment and maintenance (which in turn stabilize channels and provides wildlife habitat) and percolation of flood flows into the floodplain alluvium and slow release into the channel (which helps to sustain baseflows).

Changes in channel velocities, water surface elevations and flooding widths would be expected from restoring the channel to its predevelopment topography. The range and average differences in selected flood flow characteristics that would be expected from the 100-year flood are displayed in Table 3-15. In the long term development of riparian vegetation would provide greater resistance to flood flows and would be expected to reduce the velocity of flood flows from those that occur immediately after structures are removed.

Structural features such as walls, gabions, bank armoring, and fill slopes located within the floodplain provide erosion control, flood protection, and structural stability for many of the residences located both within and beyond the limits of the area inundated by the 100-year flood. Removal of these structural features could reduce the stability of residences that remain. Site specific investigations of foundation conditions would be necessary to assess the stability of remaining residences.

Stream Channel

Restoration of channel and floodplain topography through the recreation residence area is expected to result primarily in a “B” type channel under the Rosgen classification system. Gravel dominated, “B” type channels (“B4” channel types) are moderately sensitive to disturbance, but have excellent recovery potential (Rosgen, 1996).

Low Water Crossings

Removing the three constructed low water crossings would create head cuts that would create short reaches of incised channel. Bank erosion would be expected from newly incised channels until width/depth ratios and flood prone area widths typical of “B” type

channels could be created at the newly lowered base level of the channel. Material eroded from newly incised channels would be transported downstream to areas of lower energy where it would be deposited as bar and sediment deposits. Reworking of these deposits by fluvial processes would occur until suitable stable channel dimensions were created. Erosion of fine sediments from head cutting reaches would result in short-term increases in turbidity. Recruitment of riparian vegetation at both sites (areas of incision and deposition) would help stabilize these areas.

Water Quantity

Removing 15 of the recreation residences would reduce the domestic water uses of Columbine and Kentuck Springs. Reducing the domestic uses of these springs would allow a greater volume of flow from these springs to remain in the channel downstream of the springs. Partially restoring the flow to these channels would increase the water available for aquatic and riparian habitat. The small increase in water available for these uses would not be significant.

Water Quality

Short term increases in erosion and turbidity would be expected where structural features are removed. These effects would occur primarily during storm events and would decrease as the sites revegetate. These effects would be minimized by implementing BMPs. Roads and other cleared areas remaining under this alternative would continue to generate small amounts of sediment during storm events.

Cumulative Effects

The cumulative effects of past, present, proposed, and reasonably foreseeable future activities are similar to those described under the No Action Alternative. Recreation within the area is relatively light since recreation residences historically discouraged public use of the area. Continued presence of recreation residences would continue to discourage increased recreation in the area. Cumulatively, the effects of all activities would not add significantly to the effects of this alternative.

3.5 Wildlife and Fishery Resources

Introduction

Camp Creek, Columbine and Grapevine Washes provide riparian and aquatic habitats for a variety of wildlife and fish species. Transition areas exist between the riparian zones and uplands and provide habitat for a variety of wildlife species. This analysis will identify habitats available to terrestrial and aquatic wildlife. Direct and indirect impacts to habitat and wildlife related to Recreation Residences, in addition to cumulative effects, will be disclosed and analyzed as the area currently exists and under each of the three alternatives. Acreage displaced or affected under current management, and by each alternative will be the primary indicator for affected habitats. Natural stream function was also considered under current management and alternatives.

Analysis Area

The Camp Creek Recreation Analysis Area for wildlife and fishery resources is the watershed area of upper Camp Creek and Rackensack Canyon above the most downstream recreation residence. It includes 5,890 acres. Vegetation types are summarized in Table 3-8.

Approximate elevations for sites within portions of the analysis area are: head of Columbine tributary; 3,768 feet, head of Grapevine tributary; 3,574 feet, northern most recreation residence within Camp Creek; 3,415 feet, southern most recreation residence within Camp Creek; 3,108 feet.

Terrain is rolling on the immediate east side of Camp Creek adjacent to the recreation residences within upper and middle Camp Creek. Farther east the terrain quickly gains elevation as it approaches Kentuck Peak. Downstream of Rackensack Wash, cliffs exist on the west side of Camp Creek for approximately one mile offering an additional habitat type within the area. Grapevine and Columbine tributaries west of Camp Creek, upstream of Rackensack Wash, are moderately steep within the channel and surrounding uplands to the west could be described as rolling with increasing elevation to the east.

Uplands adjacent to the project area occur in a transitional area between the Arizona Upland Sonoran desert scrub and Interior Chaparral biotic communities (Brown 1994). The upper elevation limit identified for upper Sonoran desert scrub is 3,500 feet, and the lower elevation limit identified for Interior Chaparral is 3,500 feet (Corman, Wise-Gervais 2005). Dominate upland vegetation includes: foothill palo verde, velvet mesquite, crucifixion thorn, catclaw mimosa, juniper, turbinella oak, pointleaf manzanita, jojoba, sugar sumac, prickly pear cactus, barrel cactus, staghorn cholla, saguaro, pincushion cactus, desert Christmas cactus, beargrass and banana yucca.

The upper riparian zone is the upper most zone of riparian vegetation and is dominated by upland species that occur in greater density and stature because of their proximity and access to water. Portions of this zone burned in 2005. Many of the shrub species have re-sprouted. Juniper mortality was high.

The intermediate riparian zone is the zone below the upper riparian zone. Arizona sycamore is the most common tree within this zone and Freemont cottonwood is present but less common. Other trees within this zone include juniper, velvet mesquite and netleaf hackberry. The understory is dominated by shrub species including sugar sumac, turbinella oak, Wright's silk tassel, coffee-berry, catclaw mimosa, California buckthorn, skunkbush and poison ivy. Much of this zone burned in 2005. Many of the shrub species have resprouted; sycamores were top-killed but are resprouting from the bases. Juniper and hackberry mortality was high.

The lower riparian zone lies below the intermediate riparian zone and adjacent to Columbine and Grapevine tributaries and Camp Creek. Most common plant species in this zone are: yellow monkey flower, water bent grass, rabbit-foot grass, columbine, watercress, mint, rush, spikerush and sedges. The adjacent floodplain supports these species as well as Arizona grape, verbenas, snapdragons and lima beans.

The portion of Camp Creek downstream of Kentuck Spring to approximately ¼ mile downstream of the recreation residences provides perennial water throughout the year. The 1.5-mile portion of Camp Creek upstream of Kentuck Spring is an intermittent stream, with portions of perennial water. Grapevine and Columbine Spring are each within tributaries of Camp Creek. Columbine tributary is approximately ¼ mile long and Grapevine spring is located approximately ¼ mile west of Grapevine tributaries confluence with Camp Creek. Grapevine and Columbine tributaries typically have intermittent flows, depending upon the time of year. For additional descriptions of the project area please refer to the Riparian Specialist Report, found in the project record.

Analysis Issues

Analysis issues are used to measure the effects of the alternatives on different resources. The Interdisciplinary Team identified “issue indicators” to measure how each analysis issue would be affected by the alternatives. Each issue may have more than one indicator, depending on its complexity. Issue indicators were selected for their ability to show the differences between alternatives.

Analysis Issue 2. Wildlife

The recreation residences occupy riparian area critical to the viability of a wide array of wildlife species requiring contiguous plant cover for food and protection.

Wildlife Issue Indicator: relative change in available riparian habitat.

Analysis Issue 3. Fisheries

The recreation residences and associated structures such as retaining walls have altered the stream habitat impacting the viability of fish populations.

Fisheries Issue Indicator: short term (0 to 10 years) and long-term (11 to 30 years) change in fish abundance and distribution in the analysis area.

Affected Environment

In 2005 the Cave Creek Complex Fire burned throughout Columbine and Grapevine tributaries with an intensity, which consequently consumed all recreation residences and most of the upland vegetation. The fire burned on the east and west side of Camp Creek and through portions of the riparian areas, including two recreation residences. The fire burned southward to Rackensack Wash, and for the most part, did not burn south of Rackensack Wash in the riparian area or uplands immediately adjacent to Camp Creek. Recovery is evident in the uplands and in portions of the riparian areas. In areas that burned with higher intensity recovery is slower. Watershed issues associated with the burn have been problematic. Granitic soils in the area are highly erosive which compounds runoff issues once vegetation has been removed. Once vegetation is re-established in the upland and riparian zones, high flow events within Camp Creek should not be as frequent. High flows have been documented within Camp Creek prior to the fire and have become more frequent post -fire.

Acreages were calculated for recreation residences, roads, driveways, outbuildings, storage sheds and associated infrastructure to identify amount of habitat lost to development. Table 3-17 identifies roads, their length and approximate acreage.

Table 3-17. Existing Recreation Residence Road Estimates

Road	Length (miles)	Acreage
Grapevine Road	0.3	0.4
Columbine Road	0.1	0.1
Upper Camp Creek	0.2	*0.2
Middle Camp Creek	0.1	*0.2
Lower Camp Creek	1.0	1.3
Total	1.7	2.2

* Roads that exist within the lower/broadleaf riparian zone.

Riparian obligate species will generally occupy the lower flood prone and broadleaf deciduous riparian zones. Other species that are more dependant on upland habitats, will for the most part, occupy uplands and the upper or facultative riparian zone. The upper or facultative riparian zone may be thought of as a transition zone between the riparian area and upland habitat.

Table 3-18. Recreation Residence Tract Acreage Estimates by Riparian/Upland Zone.

Residence Tract	Lower/Broadleaf Riparian (acres)	Upper Riparian/Upland (acres)
Grapevine	*0.1	0.4
Columbine	0.1	0.9
Upper Camp Creek	0.4	1.1
Middle Camp Creek	0.4	1.3
Lower Camp Creek	0.6	3.0
Total	1.6	6.7

*Excluding lot 60 in Grapevine - elected not to rebuild, foundation and debris removed from lot.

Total habitat displaced by recreation residences, outbuildings, storage sheds, roads and driveways to uplands and riparian area is displayed in Table 3-19.

Table 3-19. Estimated Current Total Acreage Impact to Lower/Broadleaf Riparian Zones and Upper Riparian/Upland Zones by Recreation Residences, Roads, Driveways, Outbuildings and Storage Sheds

Lower Broadleaf/Riparian Zones	Upper Riparian/Upland Zones
2.1 Acres	8.4 Acres

Currently approximately 10.5 total acres of habitat are displaced in Grapevine, Columbine, Upper/Middle/Lower Camp Creek by recreation residences, outbuildings, storage sheds, roads and driveways, excluding lot 60 in Grapevine.

Table 3-20 displays other riparian systems with perennial flows and approximate direct distance from Camp Creek.

Table 3-20. Other Perennial Riparian Systems Proximity to Camp Creek

System Name	Direct Distance from Camp Creek (miles)	Approximate Perennial Flow (miles)
Seven Springs	3	1
Lime Creek	6.2	5
Cave Creek	4.8	8
New River	8.5	2

In Arizona, lowland riparian woodlands are typically found below the Mogollon Rim, in the central and southern portions of the state, at elevations of 100 to 4000 feet. Riparian woodlands comprise a very limited geographical area that is entirely disproportionate to their landscape importance, recreational value, and immense biological interest (Lowe and Brown, 1973). It has been estimated that only one percent of the western United States historically constituted this habitat type, and that 95 percent of the historic total has been altered or destroyed in the past 100 years (Krueper, 1993, 1996). Riparian woodlands are among the most severely threatened habitats within Arizona (Latta, Beardmore, Corman, 1999). These areas have been heavily used by people throughout history because of the availability of water and the retreats they offered from the surrounding desert. Impacts intensified with European settlement of the Southwest and, in recent times, dams, water pumping and diversions, clearing for agriculture or development, grazing, recreation, wood cutting and other human induced disturbances have severely impacted and fragmented riparian communities (Szaro, 1989).

General Descriptions of present conditions

Approximately 2.1 acres of lower riparian broadleaf deciduous zone and 8.4 acres of upper riparian upland zone have been displaced by presence of recreation residences and associated infrastructure. Table 3-21 (Special Status Species that Occur or may Utilize Habitat within Project Area Habitat) identifies species and primary habitat requirements.

Aquatic and riparian species are affected by seven road crossings of Camp Creek and one road crossing of Grapevine tributary. Negative effects to aquatic species associated with vehicles crossing Camp Creek and Grapevine tributary include destruction and modification of riparian and aquatic habitat, increased turbidity, sedimentation, interruption of natural stream function and possible washing of petroleum products into the systems. The roads and stream crossings also reduce area available for aquatic and riparian recruitment and development.

Two pillar bridges existed prior to the Cave Creek Complex Fire in middle Camp Creek. The bridges were damaged during the fire, but the pillars remain within portions of Camp Creek. Pillars associated with bridges could affect aquatic species habitat by creating debris jams during high flows, by direct displacement of aquatic habitat and interrupt or alter natural stream function. Suspension bridges have direct impacts to riparian and aquatic habitats, reducing available area for riparian development at either end of the bridge and reduced potential to provide shade and bank stabilization. As a result, riparian and aquatic species are affected by suspension bridges.

The Gila topminnow is listed as endangered and was stocked in Camp Creek in July 1975. Gila topminnows were reported extirpated in 1985. No topminnows have been found in Camp Creek during surveys after 1985. The Gila Topminnow Provisional Extirpation Report recommends restocking of Camp Creek, although flooding of Camp Creek has been recognized as limiting the ability of the species to remain established (Weedman, Girmendonk, and Young, 1997).

Recreation residences are provided water by Columbine, Kentuck and Grapevine springs. Recreation residence use of the three springs reduces available surface water within Camp Creek, Columbine and Grapevine tributaries. The current drought continues after a decade, with no signs of improvement and has eliminated numerous springs on the Cave Creek District that previously provided year-round water. As a result, loss of available surface water in the area has had negative impacts to wildlife/fish and

associated habitat. Aquatic, riparian, and upland wildlife species and riparian vegetation recruitment and development are negatively impacted by reduced flows due to use of springs by recreation residences.

Ten acres of non-native plant species are negatively affecting recruitment and retention of native vegetation. Riparian and upland habitat and associated wildlife and aquatic species, may be negatively affected by nonnative plant species through displacement of native plants and further expansion of nonnative plants into the surrounding wild lands.

Of the 33 unburned residences, five have undocumented waste systems, 23 have county permits, one has a composting system, one recently installed an updated waste system, and one residence was given approval in 2003 to upgrade their septic system. Several lots have remnant outhouses and pit toilets. Placement of septic systems between the homes and creek or drainage, draws concern for impacts to water quality and possible effects to aquatic and terrestrial species. Concern exists that negative long term effects may occur due to decreased water quality. Additionally, remnant outhouses and pit toilets may trap and/or injure wildlife.

Treatments to reduce vegetation around the recreation residences further reduce riparian and upland plant species recruitment and development, and in some cases, greatly reduce canopy, mid-story and ground cover. Such treatments are highly variable throughout the tract. Removal of vegetation removes and/or fragments habitat, reduces structural diversity, thermal cover, and connectivity between habitat zones is lost or greatly reduced. Fuel reduction treatments negatively affect riparian and upland habitats, and associated species, by removal and or thinning of vegetation on lots.

Domestic animals are a concern from a wildlife perspective. Domestic dogs and cats have been documented freely roaming in the project area in the past and during recent site visits. Domestic cats may also harm, harass or kill wildlife in the area. Birds are most at risk of being killed by domestic cats, which is a major concern since Camp Creek, Columbine and Grapevine tributaries host such a wide array of bird species of biological concern. Dogs and cats can prey upon or harass numerous species of wildlife that otherwise may use the area for feeding, hiding, resting, or raising young.

Feeding of wildlife by recreation residences is also an issue that may negatively affect wildlife. District records reveal that feeding of wildlife by recreation residences has been practiced for years. Feeding of wildlife may habituate animals to humans and place animals at risk. Domestic feeding may also congregate wildlife unnaturally, and promote the spread of disease or parasites which otherwise may not occur.

Presence of humans within portions of the recreation residence tracts throughout the year has negative effects on some species of wildlife. Vehicles, noise associated with lot maintenance, physical presence of people and other human disturbance may deter wildlife from occupying portions of the recreation residence tract. Riparian and upland wildlife species may be negatively affected by presence of recreation residence occupants, friends and family.

Limited public use and little to no hunting within the recreation residence tracts has in some cases, benefited wildlife. Public use of riparian resources elsewhere on the Cave Creek District has often been problematic. Proximity to Phoenix and interest in recreating in shaded areas near water has often led to modification or destruction of habitat. High recreational use near and within riparian areas has become the norm, especially during summer months. Discharging firearms is not permitted within ¼ mile of any recreation residence. As a result, some game species may find refuge from hunting

pressure within the ¼ mile zone surrounding the recreation residence tract. The unburned portion of lower Camp Creek currently offers upland and riparian habitat for wildlife that is higher quality than other portions of the recreation residence tract. The Cave Creek Complex Fire did not burn, for the most part, within the riparian zone or uplands downstream of Rackensack Wash. Recreation residence placement in lower Camp Creek is not continuous, making riparian and upland habitats more continuous and uninterrupted than other portions of the tract.

Species Background

Species to be evaluated are listed in Table 3-21. Species identified have been documented within or near the project area, or species that could utilize available habitat. Primary species habitat is shown in Table 3-16. Species effects will be presented by primary habitat group, which include aquatic, riparian, upland or in combination. Please see Appendix G for detailed species accounts.

The Tonto Forest Plan Management Indicator Species, Tonto National Forest Sensitive Species List, Partners in Flight North American Land Bird Conservation Plan and Arizona Game and Fish Department Heritage Data Base were utilized to compile the list of species. The list is intended to emphasize obligate riparian species and species that may occupy the riparian and upland habitats within the project area, with special attention paid to species of biological concern. Nearly any animal will inhabit or utilize a riparian system when such habitat is available. The compliment of species, especially birds, is very conservative.

Table 3-21. Special Status Species that Occur or may Utilize Habitat within Project Area Habitat

Common Name ³	Species	Status	Occurrence	Habitat
Gila topminnow	<i>Poeciliopsis occidentalis occidentalis</i>	E, WC	H	A
Longfin dace	<i>Agosia chrysogaster</i>	N/A	Y	A
Speckled dace	<i>Rhinichthys osculus</i>	N/A	Y	A
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	E, WC	H	R
Common blackhawk	<i>Buteogallus anthracinus</i>	S, WC, MIS	Y	R
Arizona Bell's vireo	<i>Vireo bellii</i>	S, MIS, PIF	Y	R

³ KEY S = on Regional Forester's Sensitive Species List (7/21/99); E = Federally Listed as Endangered, Under Endangered Species Act; T = Federally Listed as Threatened, Under Endangered Species Act; HP = High Priority Species; "at high risk of imperilment" (Western Bat Species Regional Priority Matrix, 1998).; MIS = Tonto National Forest Management Indicator Species (USDA 1985).; PIF = Partners in Flight, Watch List Species of Continental Importance (Migratory Bird Treaty Act, 2001).; Y = Species is known to occur within or near project area.; H = Habitat for the species occurs within the project area.; N/A = Not Applicable, no Federal or State status. Native fish present within Camp Creek.; A = Species primarily requires aquatic habitat.; R = Species primarily requires riparian habitat.; U = Species primarily requires upland habitat.; WC = Wildlife of Special Concern in Arizona (AZ Game & fish Dept. Draft 3/16/96).

Common Name ³	Species	Status	Occurrence	Habitat
Black-throated sparrow	<i>Amphispiza bilineata</i>	MIS	Y	U
Canyon towhee	<i>Pipilo fuscus</i>	MIS	Y	U
Summer tanager	<i>Piranga rubra</i>	MIS	Y	R
Hooded oriole	<i>Icterus cucullatus</i>	MIS	Y	R
Western wood-pewee	<i>Contopus sordidulus</i>	MIS	Y	R
Black-chinned sparrow	<i>Spizella astragularis</i>	MIS, PIF	Y	U
White-throated swift	<i>Aeronautes saxatalis</i>	PIF	Y	U
Elf owl	<i>Micrathene whitneyi</i>	PIF	Y	U
Costa's hummingbird	<i>Calypte costae</i>	PIF	Y	U
Lucy's warbler	<i>Vermilvora luciae</i>	PIF	Y	R
Abert's towhee	<i>Pipilo aberti</i>	PIF	Y	R
Western red bat	<i>Lasiurus blossevillii</i>	WC, HP	H	R
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	HP	H	U
Lowland leopard frog	<i>Rana yavapaiensis</i>	S, WC	H	A
Arizona Southwestern toad	<i>Bufo microscaphus</i> <i>microscaphus</i>	S	H	A
Sonoran Desert tortoise	<i>Gopherus agassizii</i>	S, WC	H	U

Environmental Consequences

This section will summarize the anticipated changes in wildlife and aquatic habitat within and adjacent to recreation residences as a result of implementation of alternatives as described in Chapter 2. The following assumptions were used in evaluating the effects.

(1) Through implementation of the permit operation and maintenance plan, Fire wise actions would be carried out by individual lot owners throughout entire tract. Fire wise actions are presumed to be similar to those carried out in the past.

(2) Administration of recreation residence permits will address the issue of residency, eliminate outside watering of native and nonnative plants, enforce removal of nonnative plants within recreation residence lots, eliminate free ranging domestic animals and feeding of wildlife by recreation residence.

Alternative 1 – No Action

The primary risk factor considered for wildlife and aquatic resources is acreage of riparian and upland habitats directly or indirectly affected by recreation residences and associated infrastructure. Additionally, affects residences and associated infrastructure may have upon natural stream function is another risk factor considered for terrestrial and aquatic resources. Existing recreation residences would likely continue to occupy the area for up to ten more years. Table 3-22 identifies recreation residence and associated roads acreages by vegetative zone under implementation of this alternative.

Table 3-22. Recreation Residence Tract and Road Acreage Estimates within Lower/Broadleaf Riparian and Upper Riparian/Upland Zones

Residence Tract /Road	Lower/Broadleaf Riparian Zone (acres)	Upper Riparian/Upland Zone (acres)
Upper Camp Creek	0.6	1.1
Middle Camp Creek	0.5	1.1
Lower Camp Creek	0.6	4.2
Total	1.8	6.4

Direct & Indirect Effects

A direct effect of implementation of this alternative would be loss of approximately 1.8 acres of lower and broadleaf riparian zone and 6.41 acres of upper riparian and upland zone for up to ten more years. This will directly affect riparian and upland wildlife species through loss of habitat, reduced forage availability and reduced recruitment of plant species. Indirect effects from loss of riparian and upland habitat include reduction in prey species abundance as a result of reduced available habitat.

Road crossings of Camp Creek and Grapevine tributary would continue for up to ten years, and result in direct negative effects to aquatic species through direct mortality or destruction, modification of habitat and interruption of natural stream function. Continued use of the road crossings would have direct negative effects to riparian wildlife species and riparian development and recruitment by displacement of habitat for up to ten years. Direct negative effects to aquatic species and riparian development through interruption of natural stream function would continue for up to ten years. For the next ten years indirect effects may be loss of riparian development over time, through displacement of habitat and reduced riparian recruitment due to soil compaction as well as the potential introduction of petroleum products and noxious weed seed.

Footbridges that have pillars placed within Camp Creek may have direct effects on aquatic species by displacement of habitat and by creation of debris jams during high flow events, that otherwise may not exist. The four suspension bridges would continue to have negative effects on lower and broadleaf riparian zone development at each end of the bridges by displacement, destruction, or modification of habitat due to existence of bridge foundations and associated anchoring. Indirect effects may be loss of riparian development over time, through displacement of habitat and reduced riparian recruitment due to soil compaction.

Direct effects to springs would continue for up to ten years. Thirty-three recreation residences would continue to utilize springs for water, thus reducing available surface water. Reduced surface flows would have direct effects on riparian development, resulting in lower potential recruitment of riparian plant and tree species. Aquatic, riparian and upland wildlife species will be negatively affected by decreased surface water availability for the next ten years, until domestic demands on spring sources cease.

Concern about direct and indirect effects from waste systems located along Camp Creek would continue under this alternative for the next ten years, until systems are removed.

Although water quality issues have not been identified through testing, concern exists in regard to aquatic and wildlife resources. Direct effects of septic systems on Camp Creek may include reduced abundance or mortality of aquatic species due to impacts to water quality. Indirect effects to terrestrial wildlife may include reduced aquatic prey base due to septic effects on water quality, although negative effects have not been documented through testing, concern exists in regard to potential effects testing may not reveal. Remnant outhouses and pit toilets along Camp Creek would continue to have potentially negative direct effects to wildlife for up to ten years. Wildlife may become trapped or injured in the remnant outhouse and pit toilets.

Treatments to reduce fuel loading near recreation residences along Camp Creek would continue under this alternative, and have negative direct effects on terrestrial and aquatic wildlife. Riparian and upland plant species recruitment would be reduced by such treatments, and as a result, would reduce available habitat and vegetation available to stabilize stream banks for up to ten years.

Direct effects due to presence of humans, associated with recreation residences, could continue for up to ten years. There could be direct effects to wildlife in response to human physical presence. Wildlife may avoid using the area in response to human physical presence, noise associated with lot maintenance, and operation of vehicles. Additional activities such as parties, loud noises, and recreational activities by recreation residences will continue to deter some wildlife from utilizing the area.

It is expected that limited public use, and little to no hunting, would continue under this alternative for up to ten years. Lower Camp Creek would continue to provide upland and riparian habitat of higher quality than the burned areas. Wildlife would be expected to continue to utilize lower Camp Creek as compared to the other riparian areas, since it is unburned and placement of residences is not continuous. Wildlife use of Camp Creek would be expected to increase, especially in lower Camp Creek, once residences and roads were removed and naturalized.

Removal of homes and associated infrastructure would have short-term direct affects to terrestrial and aquatic wildlife and associated habitats. Removal of homes would be accomplished using existing roads in a manner that would not disturb additional areas. Short term affects to aquatic and terrestrial wildlife could include noise produced from equipment, tools, and people conducting rehabilitation / naturalization of the area. Once homes and outbuildings were removed the vacancies would be predominately exposed soil and prone to erosion through the first year. Areas that previously were occupied by homes and infrastructure would be contoured to match natural grade and stabilized. Results of the effort may be highly variable depending on techniques and methods utilized. Time required to rehabilitate the area could vary, although it would be expected that erosion would be minimal and vegetation could become established in two years.

Implementation of this alternative would provide approximately 0.2 acres of lower / broadleaf riparian zone and 1.8 acres of upper riparian once residences in Grapevine and Columbine and associated roads were removed closed and naturalized. Additionally, approximately 1.9 acres of lower/broadleaf riparian zone and 6.6 acres of upper riparian /upland zone would be rehabilitated / naturalized in ten years through Lower, Middle and Upper Camp Creek. Total approximate acreage gained due removal and rehabilitation of residences, roads and associated infrastructure in ten years would be 2.1 acres of lower broadleaf/riparian zone and 8.4 acres of upper riparian/upland zone. Aquatic and terrestrial wildlife and associated habitats would gain approximately 10.5 acres of habitat in ten years.

Cumulative Effects

Past, present, proposed and reasonably foreseeable activities were reviewed to determine cumulative effects to wildlife and habitats.

Past actions and events include the following: Cave Creek Complex Fire (2005), flood events, recreation activities, St. Clair grazing allotment (no longer grazed) and a mining claim (Lower Camp Creek).

Present actions and events include the following: Forest Road (FR) 24 maintenance, FR 24 traffic, commercial traffic on FR 24, Western Area Power Authority power line maintenance, Cartwright grazing allotment, mining claim, riparian exclosure and recreation use.

Future actions and events include the following: paving FR 24 to Columbine and increased recreation use due to skyrocketing population of Phoenix.

Effects of the Cave Creek Complex Fire have been far reaching for wildlife and associated habitat. Unburned upland and riparian habitat within lower Camp Creek has become increasingly important for wildlife. Coupled with the fact perennial streams are so limited in the area, Camp Creek is very important resource for wildlife. Flooding of Camp Creek has become a recurring issue since the area burned in 2005. Flooding may push some aquatic species downstream, which later become desiccated. Flooding also removes riparian vegetation and may erode stream banks. Flooding issues further emphasize the importance of establishing ground cover and riparian development around Camp Creek, Columbine and Grapevine.

Recreation within the area is relatively light since access roads to the recreation residences have been gated precluding public access⁹ of the area. Implementation of this alternative may result in increased recreation use of Camp Creek, Columbine and Grapevine once recreation residences and associated infrastructure were removed, unless measures are taken to limit recreational use.

Forest Road 24 is one of the primary roads used to access portions of the Cave Creek District west of the Verde River. The road has been in existence since the 1930s and plans are underway to pave FR 24 to the Columbine Spring Wash crossing, to meet Maricopa County air quality standards. Traffic counters have documented 26,000 vehicles per year utilizing FR 24 in 2004. In addition, commercial use of FR 24 has increased substantially during the past decade. Vehicle wildlife conflicts have been documented in the past and will continue in the future. Not only do vehicles collide with wildlife, they also may negatively affect wildlife due to noise and or dust.

The 345 KV power transmission line, east of Camp Creek mile has little effect on wildlife, with exception of migratory birds. Migratory birds have been documented impacting power lines to varying degrees depending on structure location, guy supports and bird behavior within the area. Negative effects, primarily nighttime collisions by migrating birds, have been displayed in numerous studies. No formal monitoring for bird collisions with the power transmission line and towers has occurred. Field visits to the area in the past have not revealed evidence of mortality to birds. Maintenance to the line has been minimal and periodic helicopter flights are made along the line to check for maintenance issues.

The St. Clair grazing allotment, east of Camp Creek is no longer grazed, nor is the mine within Lower Camp Creek utilized. The riparian exclosure upstream of Upper Camp Creek will continue to be maintained to exclude livestock from the riparian zone. The

exclosure permitted riparian development and resulting wildlife benefits. The riparian exclosure has made significant recovery since the area burned in 2005.

The Cartwright grazing allotment will be stocked with a minimum number of livestock in 2008. Livestock would continue to be excluded from Camp Creek Recreation Residence tract. Downstream effects to Camp Creek from livestock grazing would be expected to be minimal under conservative utilization due to establishment of herbaceous and woody vegetation which will help reduce high surface flows and sedimentation.

Formation of backwater habitats, algae and associated debris in those habitats would increase suitability of Camp Creek for Gila topminnow introductions and long-term survivorship.

Wildlife Indicator: relative change in available riparian habitat- High

Fisheries Indicator: short term and long term change in fisheries abundance and distribution- High

Alternative 2 – Proposed Action

The primary risk factor considered for wildlife and aquatic resources is acreage of riparian and upland habitats directly or indirectly affected by recreation residences and associated infrastructure. Additional affects from residences and associated infrastructure may have upon natural stream function is another risk factor considered for terrestrial and aquatic resources.

Table 3-23 identifies recreation residence and associated roads acreages impacted by vegetative zone under implementation of this alternative. Up to 15 waste systems may be constructed off the currently permitted lot. The impacted acreage estimates in Table 3-23 do not account for possible changes to lot boundaries (if permitted) that may be required to meet county codes.

Table 3-23. Recreation Residence Tract and Road Acreage Estimates within Lower/Broadleaf Riparian and Upper Riparian/ Upland Zones

Residence Tract /Road	Lower/Broadleaf Riparian Zone (acres)	Upper Riparian/Upland (acres)
Upper Camp Creek	0.6	1.1
Middle Camp Creek	0.6	1.3
Lower Camp Creek	0.6	4.2
Grapevine	0.1	0.8
Columbine	0.1	1.0
Total	2.0	8.4

Direct & Indirect Effects

A direct effect of implementation of this alternative would be loss of approximately 2.0 acres of lower and broadleaf riparian zone and 8.4 acres of upper riparian and upland zone habitat for at least 20 more years. This will directly affect riparian and upland wildlife species for at least 20 more years as described in Alternative 1.

Road crossings of Camp Creek and Grapevine tributary would continue for at least 20 years and result in direct and indirect negative effects as described in Alternative 1.

Footbridges that have pillars placed within Camp Creek will result in direct and indirect effects similar to those described in Alternative. Effects would continue for at least 20 years under implementation of Alternative 2.

Direct effects to springs would continue for at least 20 years. Forty-three recreation residences would continue to utilize springs for water, thus reducing available surface water. Effects would be similar to those described under Alternative 1, although duration of effects would continue for at least 20 years.

Recreation residences would be required to comply with county building, environmental health and fire codes. The assumption was made that county requirements associated with septic systems would remove threats to Camp Creek, Grapevine and Columbine tributaries. There would be short-term direct effects to riparian and upland wildlife species, from removal of noncompliant systems and construction of county compliant systems; until vegetation was restored where old systems existed. There would be short-term effects from construction of new systems, to existing vegetation, until the areas were revegetated. There would be short-term negative direct impacts to wildlife since vegetation would be removed to construct new systems. The trade off is that Camp Creek, Columbine and Grapevine tributaries would no longer be exposed to septic system effects. A beneficial effect would be achieved if outhouses and pit toilets were inspected, filled and sealed as needed. The action could remove direct negative effects to wildlife, since the facilities would no longer be available to trap or injure wildlife.

Treatments to reduce fuel loading near recreation residences along Camp Creek, Grapevine and Columbine tributaries would continue under this alternative, and have negative direct effects on terrestrial and aquatic wildlife for at least 20 years. Effects are similar to those described under Alternative 1.

Direct effects due to presence of humans, associated with recreation residences, could continue for at least 20 years. Effects are similar to those described under Alternative 1.

It is expected that limited public use, and little to no hunting, would continue under this alternative for up to 20 years. Effects would mirror those described under Alternative 1.

Implementation of this alternative would continue to impact upland and riparian development for at least 20 years. Approximately 0.1 acres of additional lower and broadleaf riparian zone and 0.2 acres of additional upper riparian and upland acres would be available in Grapevine due to removal of one residence.

Cumulative Effects

Recreation within the area is relatively light, since gated roads leading to the recreation residences historically precluded public use of the area. Implementation of this alternative would likely result in continued light recreation use of Camp Creek, Columbine and Grapevine for at least 20 years.

Additional cumulative effects are the same as described in Alternative 1.

Wildlife Indicator: relative change in available riparian habitat- Low

Fisheries indicator: short term and long-term change in fish abundance and distribution in the analysis area- Low

Alternative 3 – Restore Floodplain and Riparian Area Functions and Values

Table 3-24 identifies vegetative zone acreages impacted by recreation residences and associated roads and parking areas under implementation of this alternative. Removal of sixteen residences within the 100-year floodplain, and associated roads were considered in addition to existing residences and associated infrastructure in order to obtain estimated potential loss of habitat. Potential additional loss of habitat (primarily uplands) due to 15 waste systems that could be constructed off currently permitted lots, to meet county code, was not included in Table 3-24 because it is unknown at this time if waste systems would in fact, be built outside current lot boundaries.

Table 3-24. Recreation Residence Tract and Road Acreage Estimates within 100-Year Floodplain by Vegetative Zone

Residence Tract/ Road	Lower/Broadleaf Riparian Zone (acres)	Upper Riparian/Upland (acres)
Upper Camp Creek	0.8	1.1
Middle Camp Creek	0.4	0.5
Lower Camp Creek	0.3	1.3
*Total	1.5	3.0

***NOTE:** Recreation residence number 29 burned in the Cave Creek Complex Fire and is not included in the above acreage estimate, nor is the lower Camp Creek Road because the road would remain open to permit access to recreation residences outside of the 100-year floodway.

Direct & Indirect Effects

A direct effect of implementation of this alternative would be loss of approximately 1.5 acres of lower and broadleaf riparian zone and 2.9 acres of upper riparian and upland zone habitat for at least 20 more years. Recreation residences required to be removed within the 100-year floodplain would have up to ten years to remove homes and associated infrastructure. Loss of lower and broadleaf riparian zone and upper riparian and upland zone direct and indirect effects are the same as described in Alternatives 1 & 2.

If road crossings of Camp Creek and Grapevine tributary continue, it would result in direct negative effects to aquatic species through direct mortality and destruction or modification of habitat and interrupt natural stream function. Continued use of roads crossing Camp Creek and the Grapevine tributary would have direct and indirect effects as described under Alternative 1 & 2. Direct and indirect effects would continue for at least 20 years.

Footbridges and associated foundations and entry points would have similar direct and indirect effects as described under Alternative 1 & 2, except effects would continue for at least 20 years.

Direct effects to springs would continue for at least 20 years thus reducing available surface water. Up to 27 residences could place domestic demands on springs for at least 20 years. Effects of reduced surface flows would be similar as described under Alternative 1 & 2, except duration would be for 20 years under Alternative 3.

Recreation residences would be required to comply with county building, environmental health and fire codes. The assumption was made that county requirements associated with septic systems would remove threats to Camp Creek, Grapevine and Columbine tributaries. Direct and indirect effects from waste systems would be similar to those described under Alternative 2 but duration of effects would be for at least 20 years.

Treatments to reduce fuel loading near recreation residences along Camp Creek, Grapevine and Columbine tributaries would continue under this alternative, and have negative direct effects on terrestrial and aquatic wildlife for at least 20 years. Riparian and upland plant species recruitment would be reduced by such treatments, and as a result, would reduce available wildlife habitat and reduce vegetation available to stabilize stream banks and uplands.

Direct effects due to presence of humans, associated with recreation residences, could continue for at least 20 years. Direct and indirect effects mirror those described under Alternative 2.

It is expected that limited public use, and little to no hunting, would continue under this alternative for up to 20 years. Effects would mirror those described under Alternative 1.

Removal of 17 homes and associated infrastructure would have similar effects as described under Alternative 1.

Implementation of this alternative would provide additional lower broadleaf riparian habitat and upper riparian and upland habitat development from that of current management. Approximately 0.8 acres of additional lower and broadleaf riparian zone and 1.8 acres of upper riparian and upland habitat would become available due to removal of homes and associated infrastructure within the 100-year floodplain, and removal of one residence that elected not to rebuild in Grapevine.

Cumulative Effects

Cumulative effects will be similar to those described under Alternative 2.

Recreation within the area is relatively light since recreation residences historically precluded public use of the area. Once the homes in upper and middle Camp Creek are removed (10 of 17) recreation use by the general public is likely to increase.

Wildlife Indicator: relative change in available riparian habitat- Medium

Fisheries indicator: short term and long-term change in fish abundance and distribution in the analysis area- Medium

3.6 Riparian Ecosystem

Introduction

Impacts from the Camp Creek Recreation Residences to riparian ecosystems were identified as one of three analysis issues important for designing protective measures and for measuring and comparing the effects of alternatives on resources. This section defines and describes the riparian ecosystem of the Camp Creek Recreation Residence. It describes the affected environment of the riparian ecosystem as the area currently

exists. This section discloses and analyzes the environmental effects of implementing the proposed action and other alternatives on several riparian ecosystem characteristics (issue indicators).

Analysis Area

The Analysis Area for riparian resources includes the Camp Creek watershed above the most downstream recreation residence. This is an area about nine square miles and includes the upper Camp Creek and Rackensack Canyon watersheds.

The dominant vegetation types with their corresponding acreages within Camp Creek, upland vegetation and topography of the area is more thoroughly described in the Affected Environment section for the wildlife and fishery resource of this environmental analysis. The salient statistic is that riparian vegetation covers less than one percent (0.6%) of the primary analysis area.

A larger watershed area is needed to discuss the regional significance of the Camp Creek riparian ecosystem. This larger analysis area includes the 240,183 acres of the 12 watersheds within the southwestern corner of the Cave Creek Ranger District. There are only five streams with perennial flow within these approximately ¼ million acres comprising the southwestern corner of the Cave Creek Ranger District: New River (2 miles), Cave Creek (8 miles), Seven Springs (1 mile), Camp Creek (4 miles) and Lime Creek (5 miles). The major vegetation types within this larger watershed area are summarized in Table 3-27.

Table 3-27. Vegetation types within the Southwestern corner of the Cave Creek Ranger District area based on the Southwest Regional Gap Analysis Project (Ambos, 2007b).

Vegetation Type	Acres	Percent
Water	472	< 1
Riparian	1,195	< 1
Sonoran Desert	92,133	38
Sonoran Desert Scrub	13,076	5
Semi-Desert Grassland	49,124	21
Redberry Juniper Woodland	43,708	18
Mogollon Chaparral	30,094	13
Disturbed	10,381	4
TOTAL ACRES	240,183	100

Riparian areas have importance disproportionate to their limited extent, especially in the arid Southwest. Their importance is a function of their diverse and productive vegetation composition and structure. They provide linkages between upland and aquatic ecosystems, and upper and lower watershed areas. Some of their most important functions include: 1) fish and wildlife habitat, 2) improving water quality by filtering and retaining sediment and nutrients from terrestrial uplands during over bank floods, 3) stabilizing stream banks and creating floodplains, 4) increasing water quantity and

sustained flows by replenishing ground water and 5) reducing flood velocity and erosion (Zaimes, 2006).

This limited extent of riparian acreage (approximately one percent) within the project area and larger watershed area is typical of the Southwest United States. Estimates differ, but riparian areas represent less than one percent, and perhaps less than 0.4 percent in Arizona and New Mexico (McLaughlin, 2004). Impacts to riparian areas compound the issue of limited extent of riparian areas. A review by Brinson and others (1981), an estimated 70 to 90 percent of riparian areas have been altered by land management activities in the United States.

Definition of Riparian Areas

Although riparian areas are universally recognized as critical areas in the southwestern United States, the definitions of riparian areas are widely variable (DeBano and Schmitt, 2004).

- The Forest Plan (USDA-FS, 1985) defines riparian areas as “Land areas which are directly influenced by water. [Riparian areas] usually have visible vegetative or physical characteristics showing this water influence. Stream sides, lake borders, or marshes are typical riparian areas.”
- The Forest Service Manual (FSM 2526.05, effective date: 05/26/2004) provides the following definition for riparian ecosystems: “A transition area between the aquatic ecosystem and the adjacent terrestrial ecosystem; identified by soil characteristics or distinctive vegetation communities that require free or unbound water.”

Three riparian area zones are identified within the riparian ecosystem:

1. The lower or recruitment riparian zone;
2. The intermediate or broadleaf deciduous riparian zone; and
3. The upper or transitional riparian zone.

Each of these zones is characterized by differing vegetation communities and disturbance regimes discussed both generally and for specific reaches in the Affected Environment section.

3.6.1.4 Sources of Data

Data used to describe the existing condition is based on the following sources on file at the Tonto Forest Supervisor's office (and summarized in the Project Record):

- Aerial photography (from years 1946, 1967, 1988, 1996 and 2004);
- National Wetland Inventory map of Humboldt Mountain quadrangle (1:24000) prepared by USDI Fish and Wildlife Service (between 1990-1993) from 1980 infrared aerial photography;
- Permanent photo points;
- Riparian Inventory and Monitoring data;
- Stream channel inventory and assessment data; water resources
- Field data gathered for this analysis on July 8, August 1, 17, 22, 24, September 11, 2007 and September 12, 2008;
- Maps combining post-fire orthophoto, riparian vegetation delineations and recreation residence lot boundaries (Aero-metric, Incorporated 2007).

Affected Environment

General Description of the Riparian Vegetation Zones

There are many definitions of riparian areas, but a feature common to all is that they are transitional zones between aquatic and terrestrial ecosystems. As transitional zones, riparian areas encompass gradients of environmental factors, ecological processes and plant communities that are not easily delineated (Gregory et al., 1991). For the purposes of this environmental analysis, riparian areas are divided into three zones, primarily by species composition, structure (age class), topographic, soil features and ecological processes.

Lower or Recruitment Riparian Zone

The lower or recruitment riparian zone includes both the greenline (the riparian vegetation immediately adjacent to the stream) as defined by Winward (2000) and the lower floodplain. This zone is critical to the establishment of new riparian vegetation. It is also the zone of most frequent flooding, a disturbance required to recruitment of many riparian trees. Generally, the vegetation is younger near the stream and older with distance away from the stream. The most common riparian trees in this zone are Fremont cottonwood, Goodding's willow, red willow, Arizona sycamore and velvet ash. Wetland dependent species like cattail, rushes, sedges, watercress, monkey flower, and horsetail are most occur in this zone.

Intermediate or Broadleaf Deciduous Riparian Zone

The broadleaf deciduous zone lies above the recruitment zone. Similar to the other riparian zones, the broadleaf deciduous zone also has characteristic vegetative, topographic and soil features. Flooding occurs less frequently than in the recruitment zone, creating more stable plant communities. This zone typically supports the greatest species diversity, structural complexity and total biomass. Water-loving riparian species dominate the vegetation nearer the stream channel. With distance away from the channel, vegetation yields to upland species more typically influenced by fire than floods.

The most distinctive feature in this zone is the presence of large, Arizona sycamore, Fremont cottonwood, velvet ash, and willows. Typically, these trees began in the lower riparian zone. Over time, as the channel flooded depositing sediments on the floodplain, and moved, this young floodplain became a higher terrace. These broadleaf, deciduous trees remain connected to the water table via deep taproots, but the site is no longer suitable for their recruitment. In the Grapevine and Columbine drainages, the origin of the broadleaf deciduous forest seems more closely linked with subsurface water linked to springs. As this former floodplain becomes drier, upland species like netleaf hackberry, Coahuila juniper, mesquite, and Arizona walnut begin to establish.

Upper or Transitional Riparian Zone

This zone lies at the upper end of the riparian zone. Topographically, this zone generally occupies the toe of the valley side slopes. Dominant plant species are primarily upland species, but are distinguished from upland plant species communities by structural differences. The tree component of the upper riparian zone has distinctively higher density, canopy cover and height than found in the adjacent uplands. This difference is attributable to access to water tables associated with adjacent floodplains and stream channels.

This riparian zone is transitional between the uplands and the broadleaf deciduous riparian zone. The most frequent natural disturbance in this zone is fire. Many of the species are adapted to fire, including the ability to resprout following fire. Fire regimes (intensity, frequency and size) for the upper riparian zone may be similar to the adjacent uplands.

General Description of Natural Disturbances and Human Activities

The existing condition of the Camp Creek watershed and its riparian areas has been shaped by natural disturbances and human activities. This section documents these processes.

Recent Fire and Flooding

In June 2005, the Cave Creek Complex Fire burned through the analysis area (see Affected Environment sections for water, wildlife and fishery resources in Chapter 3 of this document). Fire intensity and resulting fire effects varied in the Columbine, Grapevine and Camp Creek drainages. Most of the recreation residences and surrounding riparian vegetation burned in the Columbine and Grapevine drainages. Similar fire intensity and resulting riparian vegetation mortality occurred in the headwaters of Camp Creek above the recreation residences. Fire occurred with decreasing intensity and fire effects downstream from upper to lower Camp Creek. Fire effects are addressed more specifically for the Camp Creek Analysis area

Subsequent flooding from storms on and after September 2005 resulted in flooding in the Camp Creek watershed, impairing stream channels. Scouring, incision and excessive deposition of stream channels has impaired channel stability and function. Flooding also removed riparian vegetation. Riparian vegetation and floatable debris was also removed as part of the Burned Area Emergency Response Plan to mitigate post-fire flooding.

Recreation Residence Impacts

According to the Affected Environment for cultural resources in this environmental analysis, residential lots in the Camp Creek analysis area have been in existence for about 85 years, beginning in 1920. Activities associated with the recreation residences that have impacted or altered riparian vegetation include but are not limited to:

- Terracing, leveling, landscaping and the construction of recreation residences, outbuildings and supporting network of roads, driveways and parking areas. This has extensively modified both the riparian vegetation and its physical surfaces (floodplains, terraces and valley side slopes). Evidence of natural topographic features is often apparent only between recreation residences.
- Clearing for patios, rock walls and gardens has altered riparian vegetation and its physical surfaces;
- Vegetation thinning for Firewise, visual and other objectives;
- Introduction and occupation of ten acres of non-native vegetation;
- Water diversion for consumption and off-site irrigation;
- Road construction and stream channel crossings, check dams, retaining walls, footbridges, flood control structures have altered channels and floodplains that affected existing and potential establishment of riparian vegetation.

These impacts are described more fully in the following Existing Condition of Specific Stream Reaches section and in the Project record and in the Affected Environment sections of the water, nonnative plants, cultural, fire and wildlife and fish resource sections of the environmental analysis.

Existing Condition of Specific Stream Reaches

Table 3-29 provides estimates of the total extent of riparian area acreage within each section of the analysis area, and percent of riparian area that has been impacted by recreation residence development. Estimates include acreages of roads and recreation residence tracts including homes, driveways, outbuildings and other developments that occupy riparian areas based on lot surveys completed in September 2007. Acreages of riparian area within each section of analysis area are based on AutoCAD map riparian vegetation delineations (Aeromark, Incorporated, 2007). The map compiles 2007 color aerial photos (1:8,400), planimetric data, orthophotos and topographic data. The riparian area delineations include all riparian vegetation zones (upper, intermediate and transitional).

Table 3-29. Estimates of Riparian Acres Impacted by Recreation Residence Tracts, Total Riparian Area Acreage and Percent of Total Riparian Area Impacted by Recreation Residences for each Recreation Residence Section.

Recreation Residence Section	Riparian Acres Impacted	Total Riparian Acres	Percent of Riparian Area Impacted
Columbine Wash	1.1	2.2	50%
Grapevine Wash	0.8	2.1	38%
Upper Camp Creek	1.7	2.2	77%
Middle Camp Creek	1.9	6.4	30%
Lower Camp Creek	4.9	25.9	19%
TOTAL	10.4	38.8	27%

Each of the five recreational residence sections is briefly described in the following section. More detailed discussions are included in the Project Record.

Columbine Springs Wash

Columbine Springs Wash is tributary to Camp Creek upstream of the recreation residences (see Affected Environment for water resources in the environmental analysis). Columbine Springs Wash is situated in narrow and steep valley. The stream channel below Columbine Spring is between ten to 15 feet wide through the area of the recreation residences. There are several check dams located in the channel, and one retaining wall within the elevation of the 100-year flood. Vinca, an exotic woody vine, has spread extensively in both the lower and intermediate zone (see Affected Environment exotic plant species section of the environmental analysis).

Fire had a short-term effect on vegetation within the recruitment zone. By 2008, there was little evidence of fire in this zone. Fire burned through both the intermediate and upper zones in 2005. Most of the Arizona sycamore, the most common broadleaf deciduous tree in the intermediate zone, was top-killed. Some have resprouted. Fremont

cottonwood, present but less common, also was top-killed. Most of the Coahuila juniper and netleaf hackberry were killed. Velvet mesquite and understory shrubs were top-killed and have resprouted.

All five of the Columbine Springs Wash recreation residences were located on the northern slope. All of the residences were destroyed by the 2005 fires. Four of the recreation residences (Lots 58, 57, 56 and 53) occur primarily in the broadleaf deciduous zone, with walkways and walls extending into the lower recruitment zone. Recreation residence 52 is located above the riparian zone, although patios, walls and terraced gardens extended downward into the upper riparian zone.

It is estimated that the recreation residence tracts and their access roads have occupied and modified about 50 percent of the total riparian ecosystem acreage within the Columbine Springs Wash recreation residence section (Table 3-29).

Grapevine Spring Wash

Similar and parallel to Columbine Spring, Grapevines Spring Wash is tributary to Camp Creek, with its confluence located ½ mile downstream of the Columbine Spring Wash and the Camp Creek confluence. The valley bottom is wider than in Columbine Springs Wash. The stream channel below Grapevine Springs Wash is similar to Columbine Spring's channel, although it has less surface flow. Vegetation in this zone of Grapevine Wash is similar to Columbine Springs Wash. The extent of the 2005 fire and post-fire response is also similar to Columbine Spring tributary.

There is one check dam in the channel. Three of the four homes located in this area were at least partially within the broadleaf deciduous zone; one lies in the upper zone. The four homes (Lots 60 – 63) were destroyed in the 2005 Cave Creek Complex Fire. It is estimated that the recreation residence tracts and their access roads have impacted about 38 percent of the total riparian ecosystem acreage (Table 3-29) within the Grapevine Springs Wash recreation residence section above Forest Road 24.

Camp Creek Headwaters

The upper Camp Creek headwaters lie in an open, broad basin. The upper 1.5 mile reach of Camp Creek above the summer homes is delineated as an intermittent reach (USDI F&WS, 1991-1993). The lower quarter mile of this reach within the enclosure supports riparian vegetation with interrupted perennial flows contributed by Sycamore Canyon and Columbine Spring. The 2005 fire swept through the headwaters of Camp Creek to the downstream end of the riparian enclosure just above the recreation residences.

Upper Camp Creek Recreation Residences

The Upper Camp Creek valley is narrow with 30 to 60 percent valley side slopes. Camp Creek, averaging about 20 feet in width, is perennial in this section of the recreation residences, fed by Kentuck Springs. The broadleaf deciduous riparian vegetation above the channel and floodplain occupies narrow terraces and toe slopes. A 40-foot wide band of transitional riparian vegetation lies above the broadleaf deciduous riparian zone. Fire occurred in both these zones in 2005, but was not extensive. None of the recreation residences were destroyed in this section.

Seven recreation residences (47, 42, 1, 2, 41, 4 and 5) are included within the Upper Camp Creek group of recreation residences. Homes are located closely together, leaving little existing riparian vegetation. To accommodate homes in this narrow valley, terraces were created by excavating the valley side slopes in the upper riparian zone,

and pushing the fill toward the channel and floodplain. Large areas of broadleaf deciduous vegetation were cleared to accommodate structures, parking areas, roads, patios and walkways. The band of transitional riparian vegetation above these terraces has been varyingly thinned or cleared for fire protection or other visual objectives. Impacts to the stream channel and floodplain are caused by the access road and creek crossing, retaining walls, gabions and the Kentuck Spring development (see Environmental Consequences section for water resources). It is estimated that the recreation residence tracts and their access roads have impacted about 77 percent of the total riparian ecosystem acreage (Table 3-29) within the Upper Camp Creek recreation residence section.

Middle Camp Creek Recreation Residences

There are ten recreation residences in the Middle Camp Creek area. Five of the residences (46, 40, 7, 8 and 9) are clustered at the upper end on the eastern side of Camp Creek. The remaining five recreation residences (36, 33, 30, 29 and 54) are dispersed with 36 and 54 on the western side of Camp Creek and 33, 30 and 29 located on the east side. The 2005 fire affected Middle Camp Creek more than Upper or Lower, burning large patches of upland and riparian vegetation and destroying two homes, recreation residences 40 and 29. Camp Creek is perennial in this reach. The channel averages between 35 and 45 feet in width, with narrow constrictions of 15 to 20 feet. Floodplain vegetation was reduced in this area following the 2005 and 2006 floods. It has since rebounded with establishment of tree seedlings and thick understory graminoids and forbs. Structures identified in Table 3-14 (Water Resources Section) within the elevation of the 100-year flood include retaining walls, gabions, bank armor, bridge piers, Forest Road 24 and its fill, a driveway, low water crossing and a patio. These structures affect the natural function of the stream channel and its floodplains (Environmental Consequences section for water resources).

The riparian vegetation of Middle Camp Creek is similar to Upper Camp Creek. The valley is wider and the valley side slopes higher, providing greater opportunity for riparian vegetation development. As in Upper Camp Creek, all of the homes are located on constructed terraces, eliminated large areas of broadleaf and upper riparian vegetation. Because of their close proximity, the upper group of five residences approaches the impacts to the riparian zone described for Upper Camp Creek. The lower five houses are more dispersed, allowing for larger tracts of less disturbed riparian area between houses. Fire was not extensive in the Middle Camp Creek area of the recreation residences, although Recreation Residence 40 burned. It is estimated that the recreation residence tracts and their access roads have impacted about 30 percent of the total riparian ecosystem acreage (Table 3-29) within the Middle Camp Creek recreation residence section.

Lower Camp Creek Recreation Residences

There are 18 Recreation Residences in the Lower Camp Creek section. Recreation Residences 10 and 11 are located above the Camp Creek confluence with Rackensack Canyon. Recreation Residences 32 and 55 are located at the confluence, and the remaining 14 Recreation Residences are located below the confluence. The Cave Creek Complex Fire had little direct effect on homes or riparian vegetation in the Lower Camp Creek area.

The lower reach of Camp Creek has a distinctively different topographic setting than upper and middle Camp Creek. The height of valley side slopes increases and slopes steepens, creating a canyon. The eastern ridge lies about 1200 feet above the stream.

The western ridge about 600 feet higher than the stream. The valley bottom widens below the confluence of Rackensack Canyon and Camp Creek. The floodplains and terraces broaden, providing greater opportunity for the riparian vegetation corridor to expand. Species diversity is similar to that in Upper and Middle Camp Creek, although velvet ash increases in importance below the Rackensack Canyon confluence. Structurally, the riparian vegetation takes on the appearance of a gallery forest as the density of large old trees increases in the broadleaf deciduous zone. Mesquite bosques, lacking in the upper, narrower reaches of Camp Creek become well developed. They are particularly well developed at the confluence of Camp Creek and Rackensack Canyon. Similar to upstream, greenline and floodplain riparian vegetation diversity and cover were reduced following the summer floods of 2005 and 2006, but appear to have recovered.

As in Upper and Middle Camp Creek, lower valley side slopes in the Transition Zone were excavated with fill pushed toward the channel over the old floodplains in the Broadleaf Deciduous Zone. Some of the Upper Riparian Zone vegetation above and between the homes, especially the mesquite bosques, have been extensively thinned for fire-wise or other visual objectives. Most of the recreation residences also have structures that impact the stream channel or 100-year floodplain. They include retaining walls, gabions, bank armor, access roads, cut and fill for roads and walls and a residence. More detailed accounts of each recreation residence's impacts to riparian vegetation are included in the Project Record.

Recreation residences in Lower Camp Creek have a lower density than in Upper and Middle Camp Creek. The lower density of homes in Lower Camp Creek allows for larger patches and greater connectivity of riparian vegetation. It is estimated that the recreation residence tracts and their access roads have impacted about 19 percent of the total riparian ecosystem acreage (Table 3-29) within the Lower Camp Creek recreation residence section.

Environmental Consequences

Introduction. "Only after an eye is cast over the past can we fully appreciate how dramatically and rapidly riparian conditions in the Southwest have declined.... The rich plant life provided habitat for a plethora of animal life whose diversity and abundance was many times greater than in the surrounding desert....Stream flow is the principle force behind the structure and function of riparian ecosystems. The capacity of water to erode, transport and deposit sediments is primarily responsible for initiating and maintaining riparian ecosystems.... [Today], Southwestern rivers and riparian ecosystems are generally drier, with reduced plant density, diversity and structural complexity." (Stromberg and others 2004).

Riparian areas occupy a smaller proportion of the total land area in the Southwest than in other regions of the United States. Riparian areas in low elevation, arid deserts, grasslands and woodlands provide the starkest contrast with their surrounding upland plant communities. Camp Creek, New River, Seven Springs, Cave Creek and Lime Creel represent verdant oases that stand in sharp contrast to the arid uplands of their surrounding one-quarter million acres in the southwestern corner of the Cave Creek Ranger District. All of these perennial streams and their riparian areas have been dramatically altered by human activity in the last century. The effects of these activities to Camp Creek are discussed in the cumulative effects section.

Criteria use to Evaluate Alternatives. The criteria used to evaluate alternatives are based on the likelihood that riparian vegetation will achieve the following desired conditions described in the Tonto Forest Plan USDA (1985, 1995):

- Using desired future condition as a guide, optimize wildlife outputs in all management units by coordination of other resource activities and direct habitat improvement projects;
- Re-establish riparian vegetation in severely degraded but potentially productive riparian areas; and
- Manage riparian areas to the level needed to provide protection and management.
- Emphasize maintenance and restoration of healthy riparian ecosystems through conformance with forest plan standards and guidelines. Management strategies should move degraded riparian vegetation toward good condition as soon as possible. Damage to riparian vegetation, stream banks, and channels should be prevented.

Effects Common to All Alternatives

Direct Effects

Approximately ten acres of invasive weeds currently directly affecting recruitment and retention of riparian vegetation will be removed and replaced with desirable vegetation. Restoration activities would comply with specified Best Management Practices to mitigate temporary loss of stream bank and floodplain protection and vegetative cover.

Cumulative Effects

Past, present, proposed and reasonably foreseeable activities were reviewed to determine cumulative effects to riparian vegetation.

The most significant activity that has occurred in the past affecting Camp Creek's stream channel and adjacent riparian areas in the vicinity of the recreation residences has resulted from the construction of the recreation residences. Much of the natural topography was altered to create terraces for the recreation residence foundations and supporting structures. As a result, large areas of riparian vegetation were removed. Terraces were created or widened toward the stream channel and its floodplains. In many places, the existing floodplains are narrow and confined by retaining walls. Loss of floodplains has changed stream channel flow and flood regimes, and diminished the amount of floodplain vegetation. Riparian vegetation has been reduced to allow for outbuildings, garages, parking areas, roads, patios, gardens, walkways and other structures. The remaining vegetation has been thinned for firewise and other visual objectives.

As a result, many of the special characteristics of riparian plant communities and the wildlife upland and aquatic habitat they provide has been altered or lost. Riparian plants communities have become less diverse compositionally and structurally. Plant species composition changes include reduction or loss of plant species. The species diversity and density of grass-like species and forbs commonly found along the stream channel and at the ground level on adjacent, higher elevation streamside surfaces have been reduces. Clearing and thinning the intermediate broadleaf riparian zone has likely created a shift toward plants that can tolerate drier sites, and a reduction in plants that require wetter environments, and an increase in exotic species. Exotic species have been introduced, and many have spread aggressively along both the stream channel

and in drier plant communities. Structural changes to riparian plant communities include loss of vertical diversity and complexity, specifically, loss of multiple canopy layers. Horizontal diversity has decreased as well. Riparian vegetation is typically very dense with high canopy cover. Vegetation that was not cleared was thinned. The resulting areas are very open.

At a larger spatial scale, the landscape level character of the riparian area including the stream channel, floodplain, broadleaf deciduous zone and adjacent band of dense upland junipers, pines, oaks and mesquites has been dramatically altered. Once a continuous corridor of dense riparian vegetation, it is now fragmented, with many openings, similar to small clear cuts in a forest. Roads and driveways provide new corridors for the spread of exotic, weedy plant species.

One of the most important consequences associated with these changes to riparian plant communities have been the effects to wildlife aquatic and terrestrial habitat (see Environmental Consequences for Wildlife).

Other past activities include: Cave Creek Complex Fire (2005), post fire flood events, recreation activities, St. Clair and Cartwright grazing allotments.

Current activities include: post-fire flood events, Forest Road 24, Forest Road 483, Western Area Power Authority power line, Cartwright grazing allotment and recreation use.

Reasonable foreseeable future actions include: paving Forest Road 24 to Columbine Springs Wash and increased recreational use.

The 2005 Cave Creek Complex Fire resulted in direct and indirect effects to riparian vegetation. Within the Recreation Residence analysis area, the aerial extent and intensity of the 2005 fire was highest in the Columbine and Grapevine Springs Washes sections, with lesser impacts to Middle and Upper Camp Creek. Riparian vegetation is expected to recover naturally. Recovery rates will vary, depending on the intensity and fire effects of the burn, proximity to water and life form (herbs, shrubs or trees). Areas of burned, herbaceous vegetation along the Columbine, Grapevine and Camp Creek channels are expected to recover to pre-burn levels within ten years. Riparian vegetation, within the broadleaf and transitional riparian zones will recover more slowly. Recovery of the herbaceous and shrub species should approach pre-burn density and cover within ten years. Re-establishment of trees may require longer time frames.

The fire resulted in severe impacts to watershed conditions in Camp Creek, with resulting indirect effects to riparian vegetation. Severe erosion and sediment movement resulted from storm events following the fire. Thunderstorms following the fire resulted in flooding and channel scouring through the recreation residence area. Riparian vegetation in the lower or recruitment zone received the highest impacts, with lesser impacts to the intermediate or broadleaf deciduous zone. Vegetation on stream banks and floodplains was scoured and washed downstream. Flood frequency and severity are expected to decline as watershed conditions recover. Recovery of riparian vegetation will follow, and is expected to recover within ten to 15 years.

Recreation within the area is relatively light since gated roads to the recreation residences have historically precluded public access to the area. Continued presence of recreation residences would continue to discourage increased recreation in the area.

Historically, the boundary of the Cartwright and St. Clair grazing allotments divided the Camp Creek drainage near the confluence of Rackensack Canyon and Camp Creek.

The St. Clair allotment is no longer grazed. It is not known when cattle were excluded from the recreation residences. Removal of livestock from the recreation residence area has likely benefited riparian, aquatic and watershed conditions in this part of the Camp Creek watershed. Historically, the Cartwright Allotment included the Middle and Upper Camp Creek and the Grapevine Spring Wash and Columbine Spring Wash recreation residences. It is not known when the recreation residences were excluded from livestock grazing, but improved resource conditions, although undocumented, likely occurred. In 1996, an enclosure was constructed above the summer homes, with a well-documented improvement in riparian and stream channel condition. The allotment will be stocked with minimal cattle numbers in 2008. Watershed conditions are currently recovering from both the affects of the Cave Creek Complex Fire and past grazing impacts. When the allotment is restocked livestock will continue to be excluded from the recreation residence area and the enclosure. Watershed conditions will recover more slowly once restocking occurs.

Forest Road 24 is the primary road used to access portions of the Cave Creek District west of the Verde River. The road has been in existence since the 1930's and plans are underway to pave FR 24 to Columbine Springs Wash, to meet Maricopa County air quality standards. Short sections of the road encroach into the floodplain of Camp Creek in the Middle Camp Creek section of the recreation residence area. Cut and fill slopes encroaching into the floodplain occur from below lot 30 to lot 40. The unpaved section of FR 24 contributes sediment and turbidity to Camp Creek. Paving a short section of the road to Columbine Springs Wash will reduce this impact by a small amount.

Forest Road 483 provides access to private lands and mining claims in Rackensack Canyon. The road lies within the valley bottom of Rackensack Canyon for much of its length. The road crosses Rackensack Canyon and lies within the unmapped floodplain of the Canyon at some locations. Surface disturbance caused by the road likely contributes sediment to Rackensack Canyon, which enters Camp Creek at the upper end of the lower Camp Creek Recreational Residence area. All but one of the residences on the private lands in Rackensack Canyon were destroyed by the Cave Creek Complex Fire. Runoff and erosion from these sites may be contributing pollutants to Rackensack Canyon.

The Western Area Power Authority 345 KV power transmission line, east of Camp Creek mile has little effect on water resources. Maintenance to the line has been minimal and periodic helicopter flights are made along the line to check for maintenance issues. Maintenance that involves surface disturbing activities would add small amounts of sediment to Camp Creek.

Alternative 1 – No Action

Direct Effects

All nine of the Columbine and Grapevine recreation residences burned in the Cave Creek Complex Fire. Prior to the fire, these homes and their associated structures occupied 50% and 38% (Table 3-29) respectively, of the entire riparian ecosystem in Columbine and Grapevine Washes. The cumulative effects associated with the construction of these recreation residences to the riparian plant community were described in the Cumulative Effects described above. These homes will not be reconstructed. Any remaining structures will be removed. The landscape will be reshaped to natural contours and vegetation returned to its natural state. This will begin the restoration goal of re-establishing the structure, composition and function of

impacted riparian vegetation ecosystems in Columbine and Grapevine Springs Washes. With the exception of exotic species removal, these areas are expected to recover naturally. By the end of the 2008 summer, resprouting and colonizing riparian vegetation was rapidly recovering the burned area.

Two homes burned in Middle Camp Creek. Prior to the fire, almost half of the riparian ecosystem in the Middle Camp Creek Recreation Residence Section (Table 3-29) was dedicated to homes and their associated structures. Although the two burned homes will not be reconstructed, there will only be a minimal change in total riparian area ecosystem area in this vicinity. Most of the riparian area in the Middle Camp Creek area will continue to be directly affected by the remaining eight homes.

For the remaining 31 recreation residences in Camp Creek, the existing condition of riparian vegetation will remain unchanged for the next ten years. During this time period, the estimated acreage of riparian vegetation affected by these 31 recreation residences and supporting access roads will remain at approximately 8.5 acres or 25% of the 34.5 acres of riparian area (Table 3-29), affecting about 79, 30 and 19 percent of the riparian vegetation within Upper, Middle and Lower Camp Creek, respectively.

Indirect Effects

Over the next ten years, some activities that affect stream channel flows in Columbine Springs Wash and Camp Creek will continue to indirectly impact riparian vegetation primarily in the recruitment riparian zone. These activities include:

- water diversion from springs for consumptive use,
- maintenance and removal of constructed and low water stream channel crossings,
- maintenance and removal of stream channel structures; and
- stream channel restoration.

Of the 43 recreation residences, 31 would continue to divert water from Columbine and Kentucky springs for domestic use, reducing surface flows. Eleven recreation residences would not be reconstructed and water formerly used would be returned to the aquatic and riparian ecosystems. Currently, Grapevine Spring is not being diverted and would remain restored. Columbine Spring would continue to support the seven recreation residences in Upper Camp Creek, over the next ten years, but usage would be reduced because the five residences in Columbine Springs Wash would not be reconstructed. Domestic use would be further reduced from the existing conditions because of enforcement of the restrictions on outdoor watering. After ten years, full flows from Columbine, Grapevine and Kentucky Springs would be restored to the aquatic system, resulting in increased length and volume of perennial flow, with an indirect effect of increased establishment and maintenance of riparian vegetation.

The effect of this water diversion is considered to be relatively insignificant to stream channel function (see Water Resources Environmental Consequences) over the short-term or next 10 years. The indirect effects to riparian vegetation are also considered to be minimal, except perhaps in Columbine Canyon below the diversion, because water is not returned to this system.

Currently, there is one low water crossing in Grapevine Wash. It has begun to recover naturally. Riparian vegetation will occupy the greenline, decrease the channel width and stabilize resulting stream banks. There are three constructed and four low water crossings in Camp Creek. These would remain in place for ten years. Additionally, there

are numerous in-channel structures (Table 3-14 in the Affected Environment of the Water Resources Section). The crossings and structures are currently interrupting the natural stream channel function and riparian vegetation development. They will be removed in ten years. Removing the structures and low water crossings that encroach on the floodplain, and restoring the predevelopment channel and floodplain topography has both long and short-term indirect effects to riparian vegetation. Over the long-term, restoration of natural channel function should result in riparian recruitment and maintenance. During the short-term, there would be a period of stream channel adjustment, or instability, of unknown duration that could include head cutting, erosion and deposition that could have indirect effects to existing riparian vegetation and potential recruitment of riparian vegetation primarily within the lower or recruitment riparian zone.

Disturbance to stream channels and riparian vegetation would continue for ten years where residences and associated structures encroach into the channel and floodplain. These impacts would be reduced following restoration although cut and fill slopes of FR 24 would continue to encroach into the channel and floodplain in the Upper and Middle Camp Creek Recreation Residence Area.

Consistency with Forest Plan Direction for Riparian Areas

The intent of the Forest Plan will not be met over the short-term or next ten years. These areas will primarily be managed for recreation residences. There will be little opportunity to re-establish riparian vegetation in the upper riparian zones. Riparian ecosystems will remain fragmented. Treatments to reduce fuel loadings will continue, directly affecting the species composition, structural diversity and ecosystem function of the riparian habitats.

At the end of ten years, structures will be removed, the landscape reshaped to natural contours and the vegetation returned to its natural state, and over a period of time, reversing the adverse impacts described above. Once the homes and supporting structures are removed and the site naturalized, this alternative will achieve the desired conditions described in the Forest Plan.

Riparian Area Indicator: relative change to host riparian vegetation- High

Alternative 2 – Proposed Action

Direct Effects

The existing condition of riparian vegetation within the recreation residence analysis area will remain unchanged for the next 20 years, continuing to compound the cumulative effects to the riparian plant communities describe in the Cumulative Effects section above. During this time period, the estimated acreage of riparian vegetation affected by these 43 recreation residences and supporting access roads will remain at approximately ten acres or almost 27% of the riparian ecosystem with the analysis area (Table 3-29). This area represents about 50, 38, 77, 30 and 19 percent of the riparian vegetation within the Columbine, Grapevine, Upper, Middle and Lower Camp Creek areas, respectively.

Indirect Effects

Water diversion from springs for consumptive use, constructed and low water stream channel crossings and stream channel structures will continue to affect stream channel

flows in Columbine and Grapevine Springs Wash and Camp Creek with indirect effects to riparian vegetation, primarily in the recruitment riparian zone.

Water would continue to be diverted and used for domestic purposes from Columbine, Grapevine and Kentucky Springs. Enforcement of the restrictions on outdoor watering and six month occupancy periods would reduce diversions from Columbine, Grapevine, and Kentucky Springs to levels below those prior to the Cave Creek Complex Fire. Reconstruction of homes destroyed by the fire would result in diversions greater than currently occur. This will reverse any increases in establishment of riparian vegetation that has occurred since 2005. Overall, stream flow will continue to be reduced, maintaining the limits to riparian area establishment and maintenance.

Structures, including constructed stream channel crossings and low water crossings within the stream channel and 100-year floodplain (see Table 3-14 in the Affected Environment of the water resources section) are currently interrupting the natural stream channel function and riparian vegetation development. Many residences will continue to have foundations, retaining walls, gabions, bank armoring, and cut and fill within the 100-year floodplain affecting flood flows. The natural functions and values of the Camp Creek floodplain will continue to be impaired, limiting the opportunities for riparian area development and maintenance.

Consistency with Forest Plan Direction for Riparian Areas

Under this alternative, the intent of the Forest Plan direction for riparian areas will not be met. These riparian ecosystems will primarily be managed for recreation residences, with little opportunity to re-establish riparian vegetation in the broadleaf deciduous or transitional zones. Riparian ecosystems will remain fragmented. Treatments to reduce fuel loadings will continue, directly affecting the species composition, structural diversity and ecosystem function of the riparian habitats.

Riparian Area Indicator: relative change in available area to host riparian vegetation -Low

Alternative 3 – Restoring Floodplain and Riparian Area Functions and Values

Direct Effects

Grapevine and Columbine Springs Washes

All nine of the Columbine and Grapevine recreation residences burned in the Cave Creek Complex Fire. Eight of these homes will be reconstructed. All but one of the houses lies within the riparian zone. Approximately 50% of the Columbine Wash and 38% of the Grapevine Wash riparian habitat will be primarily managed for recreation residences (Table 3-29), continuing to compound the cumulative effects to the riparian plant communities describe in the Cumulative Effects section above.

Upper Camp Creek

There are seven recreation residences in Upper Camp Creek. Of the five recreation residence sections, Upper Camp Creek homes and supporting structures occupy the highest percent of the total riparian ecosystem. Six of the seven homes and associated structures located within the 100-year floodplain will be removed within a negotiated time not to exceed ten years. The landscape will be reshaped to natural contours and vegetation returned to its natural state. This will restore most of the structure, composition and function of the currently occupied 2.2 acres (77 percent) of the riparian

ecosystem (Table 3-29) in the Upper Camp Creek section. The need to alter riparian vegetation density and cover for fire prevention will be greatly minimized.

Middle Camp Creek

There are ten recreation residences in Middle Camp Creek. Two of the homes burned in the 2005 fire. Both of these homes could be reconstructed above the 100-year flood elevation, but still within the riparian ecosystem. Of the eight currently remaining homes, four are located in the 100-year flood elevation and will be removed and riparian vegetation restored within a negotiated time not to exceed a 10-year period. One of the three recreation residences above the 100-year floodplain is protected by a wall that will be removed. Under this alternative, there could be six homes within the Middle Camp Creek Recreation Residence Section. All of the six homes (either currently standing or to be reconstructed) occur within both the broadleaf deciduous and transitional riparian ecosystems. It is estimated that the existing 1.9 acres (30 percent) of riparian area currently impacted by the original ten existing or burned structures will be reduced to approximately to 1 acre or 16 percent of the total riparian area in the Middle Camp Creek area (Table 3-29).

Lower Camp Creek

There are 18 recreation residences in Lower Camp Creek. Five of these residences have homes within the 100-year floodplain. Fourteen of these recreation residences have supporting structures within the floodplain. All of these supporting structures and the five homes will be removed within a negotiated time not to exceed ten years. This will reduce the total riparian acreage within the Lower Camp Creek area impacted by recreation residences. Correspondingly, the amount of total riparian acreage within the Lower Camp Creek area impacted by recreation residences will be reduced. However, the, landscape level fragmentation will remain the same, with the access road remaining unchanged. Many of the changes to the riparian vegetation described in the Cumulative Effects section above remain the same.

Summary of Direct Effects

There are 31 recreation residences that have homes or other supporting structural features (road surfaces, road cut and fill slopes, retaining walls, constructed low water crossings, power poles and check dams) that encroach within the boundaries of the 100-year flood. Of these, there are fifteen recreation residences that have homes within the boundaries of the 100-year flood. Recreation residence impacts to riparian vegetation will remain unchanged for the next ten years in Camp Creek. After ten years, all of the structures within the 100-year floodplain will be removed. The landscape will be reshaped to natural contours and vegetation returned to its natural state. In Columbine and Grapevine Springs Washes, burned homes will likely be reconstructed in the riparian vegetation zones within the next ten years.

Indirect Effects

Over the next ten years, some activities that affect stream channel flows in Columbine Springs Wash and Camp Creek will continue to indirectly impact riparian vegetation primarily in the recruitment riparian zone. These activities include:

- water diversion from springs for consumptive use
- maintenance and removal of constructed and low water stream channel crossings
- maintenance and removal of stream channel structures

- stream channel restoration

If homes that burned are reconstructed, 43 of the recreation residences could continue to divert water from Columbine, Grapevine and Kentuck springs for domestic use, reducing surface flows for ten years. After the 15 homes within the 100-year floodplain are removed, 27 recreation residences could continue to divert water from Columbine, Grapevine and Kentuck springs for domestic use, reducing surface flows for 20 years. Enforcing outdoor watering restrictions, enforcing 6-month occupancy requirements, and restoring partial flows from Columbine, Grapevine and Kentuck Springs to the aquatic system, will result in increased length and volume of perennial flow, with an indirect effect of increased establishment and maintenance of riparian vegetation.

Currently, there is one constructed low water crossing in Grapevine Wash. It has begun to recover naturally. Riparian vegetation will occupy the greenline, decrease the channel width and stabilize resulting stream banks. Several un-constructed low water crossings will remain on Camp Creek. These crossings will continue to maintain the channel in a widened condition, and prevent riparian vegetation from establishing. There are three constructed crossings in Camp Creek. These would remain in place for ten years. Additionally, there are numerous in-channel structures (Table 3-14 in the Affected Environment of the water resources section). The crossings and structures are currently interrupting the natural stream channel function and riparian vegetation development. They will be removed in ten years. Removing the structures and low water crossings that encroach on the floodplain and restoring the predevelopment channel and floodplain topography has both long and short-term indirect effects to riparian vegetation. Over the long-term, restoration of natural channel function should result in riparian recruitment and maintenance. During the short-term, there would be a period of stream channel adjustment, or instability, of unknown duration that could include head cutting, erosion, and deposition that could have indirect effects to existing riparian vegetation and potential recruitment of riparian vegetation primarily within the lower or recruitment riparian zone.

Disturbance to stream channels and riparian vegetation would continue for up to ten years where residences and associated structures encroach on the 100-year floodplain. These impacts would be reduced following the removal of structures within the 100-year floodplain associated with 31 recreation residences. Cut and fill slopes of FR 24 would continue to encroach into the channel and floodplain in the Upper and Middle Camp Creek Recreation Residence Area. Disturbance to riparian vegetation would continue for the remaining 27 recreation residences.

Consistency with Forest Plan Direction for Riparian Areas

Under this alternative, achievement of the intent of the Forest Plan direction for riparian areas will vary by recreation residence section. In Upper Camp Creek, most of the structure, composition and function of the riparian ecosystem will be restored. For the other recreation residence sections, (Columbine and Grapevine Springs Washes, Middle and Lower Camp Creek), riparian ecosystems will remain fragmented, with little opportunity to re-establish riparian vegetation in the broadleaf deciduous or transitional zones. Thinning to reduce threat of fire will continue to reduce the vertical and horizontal structural complexity, species composition diversity, and ecosystem processes and services within the riparian area. These riparian ecosystems will primarily be managed for recreation residences.

Riparian Area Indicator: relative change in available area to host riparian vegetation - Low to Medium

3.7 Fire and Fuels

Introduction

This specialist report is an analysis of the Camp Creek Recreation Residence and its relationship with fire. It will discuss what fuel types are within the analysis area. It will also discuss fire's history in and around the analysis area for both naturally caused fires as well as human caused fires. We will also discuss the Firewise community, how the various alternatives will affect fuel types, fire history and how firewise actions will affect fire in and around the tract and what recommendations will be proposed for the analysis area.

Analysis Area

The analysis area for fire and fuels is 873 acres comprised of 43 currently permitted residential lots along Camp Creek wash north of the town of Scottsdale. It is divided into five clusters or units: Columbine tract with five lots, Upper Camp Creek with seven lots, Middle Camp Creek with ten lots, Lower Camp Creek with 18 lots and Grapevine with three lots. This analysis will also look outside the residence tract and into the surrounding area for one square mile, to analyze recommendations of defensible space.

Fire History and Fuel Types

The analysis area is predominately a riparian area surrounded by chaparral and grass fuel types; the entire existing tract is located in the riparian area, which represents approximately 60 percent of the analysis area. The remaining 40 percent of the analysis area contain chaparral and grass fuel types. The chaparral fuel type is Turbinella Oak, which has a historic fire return interval of 75 to 100 years. The grass fuel type of many species has a historic fire return interval of 7 to ten years. In 2005 the Cave Creek Complex Fire burned through the entire area. Annual grasses have the possibility of always being present depending on the annual rainfall in any given year. The abundance of grasses creates the potential for wildland fire to affect the analysis area throughout the year. The Cave Creek Complex Fire of 2005 burned through or around the Columbine, Grapevine and Upper Camp Creek tracts. Fire affected each area differently. In the Riparian zone, fire intensity decreased as it entered that area. Most homes within this area were not effected due to low fuel loading and the riparian fuel type. The exceptions were the homes that had continuous fuels. The permittees that had followed Firewise instructions and the homes that had enough defensible space were saved. In the analysis area above the Forest Service road 24, the tracts of Columbine and Grapevine lie in a Chaparral fuel type. All recreation residences in this area were destroyed by intense fire but due to continuous heavy fuel loads under dry conditions. Wildland fire is a natural occurrence in this area during periods of low plant moisture.

Environmental Consequences and Fire Response

Firefighter and public safety are the top priorities. A concern of firefighters is the access to the Camp Creek residence area. The road leading to lower camp creek does not provide firefighters with a safe access to the site to turn around or for incoming and outgoing traffic. There are insufficient safety zones (large open areas free of burnable material) for firefighters throughout the site. Access to middle and upper camp creek also presents problems for firefighters. Roads to recreation residences are extremely narrow in most cases and any fire that would start there would require firefighters to attack the fire from an uphill position; a dangerous situation for firefighters. However, recreation

residences in Columbine, Grapevine, Middle and Upper Camp Creek could be accessible from Forest service road 24. Firefighters would have escape routes (a route a firefighter would take to a safety zone) and safety zones that could be accessed quickly.

Environmental Consequences

Effects Common to all Alternatives

Fire as a natural occurrence would continue to play a role in the analysis area. The amount of rainfall would determine the amount of annual grasses that will grow in the area. This would in turn determine the potential and intensity of fires. Effective initial attack to the residential area will depend on the current fire conditions and the current fire location. Therefore Firewise Communities that follow the summer home permits guidelines will provide firefighters the best opportunity to save public land and personal property. Established Firewise Guidelines (see Appendix C) would be included in the new permit and revised operational plan. Therefore, the above stated recommendations would apply for the selected alternative.

Alternative 1 – No Action

Direct Effects

Not authorizing the rebuilding of structures in the Columbine and Grapevine area would reduce the potential of an accidental human ignition or structure fire that could spread to the forest. Any recreational activity in this area could raise the potential of an accidental human ignition. Values to be protected in this area would be National Forest resources and not life and property.

The potential of an accidental human ignition or structure fire would still exist for ten years along the residential area of Camp Creek. Values to be protected in this area would remain as life and property as the first priority. Historically we have not had problems with human ignitions in these areas. The fires that we have documented were lightning caused fires that started on the upper elevations above the residence on top of the ridgelines, and the mid-slope areas of the mountains surrounding the area.

Indirect and Cumulative Effects

A change of firefighting strategy and tactics would be implemented depending on incident location. Not authorizing the rebuilding of structures In the Columbine and Grapevine area, firefighting strategy would utilize basic firefighting tactics in the Wildland. Firefighting tactics could be placing firefighters directly on the fires edge or backing off and going indirect of the fires edge and burning out from roads or natural barriers without the complication of structures involved.

Firefighting strategy and tactics would change in the area along Camp Creek for ten years due to the values of protecting life and property. Access into this area is one way in and one way out. In the event of a fire starting in this area, residence would be evacuating the area along the one-way road thus impeding firefighting resources access to the area. Firefighters would utilize a defensive tactic if possible to protect structures thus complicating the firefighting environment.

There are no known cumulative effects of fire management in this area. The Sonoran Desert fuel type is not a fire-adapted ecosystem and therefore prescribed burning operations are not planned.

Alternative 2 – Proposed Action

Direct Effects

Authorizing the rebuilding of ten structures in the Columbine and Grapevine area would increase the potential of an accidental human ignition or structure fire for 20 years. Values to be protected in this area would be life and property as the first priority.

Renewing 33 recreation residence special use permits along Camp Creek for a 20-year period would continue the potential of an accidental human ignition or structure fire. Values to be protected in this area would remain as life and property as the first priority. Historically we have not had problems with human ignitions in these areas. The fires that we have documented were lightning caused fires that started on the upper elevations above the residence on top of the ridgelines and the mid-slope areas of the mountains surrounding the area.

Indirect and Cumulative Effects

A change of firefighting strategy and tactics would be implemented depending on incident location. Authorizing the rebuilding of ten structures in the Columbine and Grapevine area would cause firefighters to utilize a defensive tactic if possible to protect structures thus complicating the firefighting environment.

Firefighting strategy and tactics would not change in the area along Camp Creek for 20 years due to the values of protecting life and property. Access into this area is one way in and one way out. In the event of a fire starting in this area, residence would be evacuating the area along the one-way road thus impeding firefighting resources access to the area. Firefighters would utilize a defensive tactic if possible to protect structures thus complicating the firefighting environment.

There are no known cumulative effects of fire management in this area. The Sonoran Desert fuel type is not a fire-adapted ecosystem and therefore prescribed burning operations are not planned.

Alternative 3 – Restoring Floodplain and Riparian Area Functions and Values

Direct Effect

Authorizing the rebuilding of ten structures in the Columbine and Grapevine area would increase the potential of an accidental human ignition or structure fire for 20 years. Values to be protected in this area would be life and property as the first priority.

Renewing 33 recreation residence special use permits along Camp Creek for a 20-year period would continue the potential of an accidental human ignition or structure fire. Values to be protected in this area would remain as life and property as the first priority. Historically we have not had problems with human ignitions in these areas. The fires that we have documented were lightning caused fires that started on the upper elevations above the residence on top of the ridgelines and the mid-slope areas of the mountains surrounding the area.

Reducing the number and type of structures in intermittent and perennial stream channels may not have a significant effect to Wildland fire potential and structure protection. Relocating structures outside of riparian areas would place structures in somewhat drier vegetation that could potentially burn at higher intensity depending on the amount and species of vegetation in the area.

Indirect and Cumulative Effects

Authorizing the rebuilding of ten structures in the Columbine and Grapevine area would increase the potential of an accidental human ignition or structure fire for 20 years. Values to be protected in this area would be life and property as the first priority.

Renewing 33 recreation residence special use permits along Camp Creek for a 20-year period would continue the potential of an accidental human ignition or structure fire. Values to be protected in this area would remain as life and property as the first priority. Historically we have not had problems with human ignitions in these areas. The fires that we have documented were lightning caused fires that started on the upper elevations above the residence on top of the ridgelines, and the mid-slope areas of the mountains surrounding the area.

Table 3-30. Cave Creek Ranger District Wildfire History from 1960 to 2006

Note: only years with fires within the analyzed area are listed.

Year	Fire Name	Acres
2005	Cave Creek Complex	248,000
2004	Springs	53
2004	Humboldt	928
2004	Bluebird	0.25
2003	Bronco	0.10
2002	Rackeback	0.20
2002	Humboldt	1
2002	Kentuck	0.10
1999	Blue	0.10
1999	Rackensack	0.20
1999	Springs	0.10
1997	Humboldt	2
1997	Rackensack	0.20
1997	Rack	1
1994	Kentuck	10
1994	Rackensack	15
1993	Humboldt	20
1989	Rack	0.50
1989	Sack	1
1989	Blue	2.5
1989	Springs	0.30
1986	Kentuck	2
1985	Rackensack	0.10

Year	Fire Name	Acres
1985	Humboldt	0.10
1985	Kentuck	0.25
1985	Sears	0.10
1985	Columbine	0.10
1982	Rackensack	0.25
1979	Humboldt	0.10
1979	Rac	4
1979	Seven	0.25
1976	Humboldt	0.10
1976	Sack	3,500
1976	Hum	140
1976	Kentuck	8
1966	Humboldt	9
1966	Spring	0.10
1960	Humboldt	40

3.8 Heritage Resources

Affected Environment

The historic Camp Creek Recreation Area (CCRRA) has been recognized as a Heritage resource and has been assigned an inventory number of AR-02-12-01-1197. As such, it contains both the current Recreation Residences coming up for permit renewal and a number of lots that have been split, combined, abandoned or never used. It is comprised of 44 currently permitted residential lots located along several reaches of Camp Creek and its tributaries Grapevine Creek and Columbine Creek northeast of Carefree, accessed by Forest Road 24. It is divided into five lot clusters usually referred to as units: Upper (7 lots), Middle (10 lots), and Lower Camp Creek (18 occupied and four abandoned but archaeologically recognizable lots, all but one of which are located immediately adjacent to the creek), and the Grapevine (4 lots) and Columbine (5 lots) units, both located west of FR24. Originally conceived as a mixed-use recreation area with a combination of residential, camping and day use facilities it was initiated (as far as extant records can attest) sometime prior to 1920 (Wood 2007). It was originally platted for 31 residential lots, six or so picnic areas and about 20 campsites, with plans for a “Kiwans Clubhouse” and tennis court, neither of which was apparently ever built. Sometime prior to 1932 a commercial operation had been added to the little seasonal community in the form of a store and gas station in Lot 59. Also during the 1930s the non-residential recreational use disappeared. During this time the CCRRA came to benefit from several Depression Era public works programs that contributed so much to the creation and enhancement of infrastructure throughout the National Forests of Arizona (Collins, 1999). A water system was built, probably by the Works Progress Projects Administration (WPA), piping water from Kentuck Spring all the way down to the Lower Camp Creek unit. The WPA also built their famous “flyproof” toilets for nearly every one of the lots occupied during that period, as part of the Community Sanitation Project that they inherited from the Civil Works Administration (Collins, 1999). About a dozen of these are still standing in the CCRRA, more or less intact. Surprisingly few of the 2.3 million such toilets built in the U.S. between 1933 and 1941 are still extant; the CCRRA may have one of the largest remaining concentrations. Several drainage and erosion control structures along the main access road (FR 24) appear to have been WPA-built as well, part of the improvements they are known to have made to the road south of the CCRRA, possibly as part of the “Mines to Markets” road program. Finally, the Civilian Conservation Corps (CCC) built erosion control walls along portions of Camp Creek and flow control weirs on Columbine Creek.

Despite a small “building boom” in the postwar 1940s, the availability of reliable transportation and better roads across the Forest had rendered the recreational residence concept in this area, virtually on the outskirts of Phoenix, obsolete. From that point on the CCRRA began a transformation from a seasonal recreational area to a residential community, though there are indications that this transformation was already well underway during the 1930s.

Over the decades since then, a number of lots have been abandoned or lost to flooding and a number have been added, including nine on the west side of the road, away from Camp Creek itself (the Grapevine and Columbine units). Likewise, a number of the original residences have been replaced; Cave Creek District records indicate that the oldest residence still under permit was built in 1942, though residents claim that at least portions of several of them go back as far as 1915. However, the residences have all

been added to and modified in many ways. The residents have also put up a variety of rock walls and earthworks to protect their houses from flooding and many of them have also added terraced and bordered gardens filled with all manner of non-native vegetation. The introduction of so many non-native plants was, in fact, transforming the original natural setting of the Sonoran Desert riparian zone in which most of the lots are located into something quite different from what it was originally. However, the Cave Creek District has initiated a program to remove non-natives from the entire tract to return its vegetative setting to something much closer to what would be expected in a Sonoran Desert riparian area.

In addition to the occupied and abandoned residential lots, the CCRRA also contains the remains of several abandoned public recreation areas; access roads; pedestrian bridges; masonry, concrete and gabion-based flood-protection and land-leveling retaining walls; and three separate water systems. The primary water system, mentioned earlier, appears to have been originally constructed by the WPA. It originates at a concrete spring box on the east side of Camp Creek at Kentuck Spring in the Middle Camp Creek section. From there it runs down the east side of the creek in a partially buried pipeline to most of the lots in the Middle and Lower Camp Creek sections, distributed to both residential lots and public campgrounds by means of small cemented rock masonry hydrants, most of which are still intact and functioning. The pipeline and its rockwork terrace are still visible from many of the lots and from FR24, especially in the canyon section between Middle and Upper Camp Creek. Where it crosses side canyons, it is carried by light metal trestles. The Columbine water system originates at Columbine Spring on the west side of FR 24 and is delivered via a buried pipeline and valve boxes to the lots in the Columbine section, Upper Camp Creek and several of the lots in Middle Camp Creek on the west bank. The Grapevine system involves multiple small springs in Grapevine Creek delivered to valve boxes at the individual lots via buried pipelines and surface collection cisterns.

Occupation History and Development Summary

A detailed occupation history for the CCRRA is available in the National Register Eligibility report (Wood 2007) prepared for this analysis, at least to the extent that information is available. A complete occupational history cannot be developed for any of the 44 lots currently under permit. Indeed, we cannot even be certain when the CCRRA was established or by which National Forest. The original permits and most file data on renewals, inspections and transfers are simply no longer available on the Tonto National Forest. Some of this information may be held in the National Archives, but, given the time, difficulty, and expense of retrieving that information, if it still exists, it was deemed unnecessary merely to determine eligibility. Therefore, for the purposes of this determination we have assumed that it originated on the Prescott National Forest in 1915 with the passage of the Occupancy Permits Act, the legislation that, in effect, created all recreation residence areas and that it was subsequently handed off to the Tonto National Forest in 1923 when the boundaries were adjusted between the two forests.

Fairly extensive histories of permit holders are available for 18 of the 44 lots; this information allows us to take ownership of these lots back as far as 1950, but the record is frequently full of gaps. Nearly all of the lots have a fairly complete record of permits, renewals, transfers, sales, and inspection and correspondence from 1972 to the present, but even so, gaps still remain. At the very least, review of the lot permit files has revealed a significant characteristic of lots in the CCRRA that makes it different from what is seen in other parts of the country: with very few exceptions, these lots changed

hands frequently (an average of three to five owners between 1972 and present) and their files are full of evidence that most new owners felt compelled to leave their own mark on the properties in the form of additions or modifications to the residences or grounds, often to the point of removing the original structure and replacing it with something else (see Wood, 2007).

For the most part, then, we are able to reconstruct the occupational history of the CCRRA only in general terms based on the surviving tract maps and a couple of historic inspection reports, the last of which is dated 1958. Based on this information the occupational history of the CCRRA is as follows.

Based on the presence of archaeological remains in the lower Camp Creek section of the CCRRA (Wood, 2007) and lower Rackensack Canyon as well as on notations a set of maps drawn from a 1920 survey of the CCRRA (reproduced in Wood, 2007), there appears to have been a small settlement of miners living illegally along these drainages (where there is permanent water) supporting small-scale mining operations farther up Rackensack Canyon. At that time, what is now Forest Road 3207, the road that accesses lower Camp Creek, continued south of the CCRRA and was part of the primary road between Phoenix and the 7 Springs and Red Rover Mine area; a new road more or less on the current alignment of FR24 replaced it in 1928, leaving 3207 as little more than a “driveway” accessing the recreation residences.

The 1920 maps represent the earliest information available for the CCRRA. These maps show 31 residential lots. In addition to the residential loci depicted on these maps, they also show the locations of 23 camp sites noted as having been used in the past, four picnic grounds, a combination picnic and campground, a parking lot and one site designated for “proposed tennis courts.” Clearly, as it was depicted on these maps, the CCRRA was originally intended to be managed as a mixed use permitted residential and public recreation area.

A map from 1932, surveyed in 1926 and revised in 1932 (reproduced in Wood, 2007), shows a considerable expansion of the residential aspect of the CCRRA. There are now 58 numbered lots laid out, none of which are identified by their permit holders. There have also been changes in the location and distribution of the lots. Two of the original lots were removed, probably as a result of their loss to flooding and the largest of them had been subdivided.

By the time of the 1932 survey, 27 new lots had been laid out and permitted or offered for permit. Eight of these were in the Lower Camp Creek group, ten in the Middle Camp Creek group, and two in Upper Camp Creek group. Several of the new lots were designated in areas that had previously been used as public campgrounds and picnic areas and one, Lot 59, was permitted well away from the other riparian lots up on FR24 to provide for the operation of a local gas station and general store. Also, the Columbine Creek recreation residence group first shows up on this map, seven lots located on a ridge overlooking a tributary of Camp Creek.

Based on the information contained in this map, the management emphasis for the CCRRA had begun to change in the late 1920s toward an increased emphasis on permitted residence and a restriction of public access. While there was still public camping along Camp Creek, it was now confined to three small designated campgrounds, one near the lower end of the tract, another at the confluence with Rackensack Creek, where the proposed tennis courts were supposed to go, and the third in the Middle group. These campground areas are shown on the map as having been developed to some extent by virtue of the depiction of toilets for each of them.

By the end of the decade overnight public camping had been eliminated and the three campgrounds had been reduced to two picnic grounds. Recent inspection of the area (Wood, 2007) indicates that the camping and picnic ground in the Middle group has been lost to erosion and the construction of a road accessing Lots 29 and 30. The eroded vaults of the two WPA toilets that served this area were relocated, however, a short distance up the unnamed side drainage just to the west of FR 24. The Rackensack Canyon camping and picnic area can still be recognized as a cleared area in the mesquite adjacent to Lot 32; a water hydrant serving the area remains intact but no trace could be found of the public toilets. The lower campground has long since washed away, but its water hydrant and one collapsed WPA toilet have been relocated (Wood, 2007).

Another map, drawn in 1949 from surveys in 1946 and 1949 (reproduced in Wood, 2007), depicts a total of 51 lots. This time the lots are shown with corner and boundary information but not the names of the permit holders. There are several significant changes to the tract by this time relative to its pre-war condition. Eighteen lots had been abandoned or their permits cancelled by 1949: one in the Upper Camp Creek group; four in the Middle Camp Creek group; 11 in the Lower Camp Creek group; and two in the Columbine group. Most of these were lost to flooding, though several appear never to have been occupied and one, Lot 59, the store and gas station, may have been abandoned for economic reasons during the war. At the same time, ten new lots were offered: six in the Lower Camp Creek group and four new lots that established a whole new group in the Grapevine Creek tributary south of Columbine just after the war. The new lots in the Lower Camp Creek group were primarily revisions and consolidation of previous lots.

Annotations made only a year later on a copy of the 1949 map indicate the cancellation of six additional lots: five in Lower Camp Creek and one in Middle Camp Creek group.

Another brief inspection report made in 1958 and shown as annotations on another copy of the 1949 map (see Wood, 2007) identified six lots for elimination as they proved to be too steep or were no longer in use. This was done in 1959 and it appears that the public recreation campgrounds and picnic areas were closed down or simply abandoned. Implementation of the recommendations of the 1958 report in 1959 established the "final" configuration of the CCRRA tract; since then no lots have been added or cancelled and no changes have been made to their size or shape. From that point forward the makeup of the Camp Creek tract remained unchanged until the fire in 2005.

Since this "final" configuration established the CCRRA as primarily a seasonal residential area with no public recreation component, 1959 is used as the temporal marker for the end of the historic period for the CCRRA.

The only recent changes to the tract involve the construction of power and telephone lines into the area during the 1970s and the loss of the residential structures on Lots 29, 40, 52, 53, 56, 57, 58, 60, 61, 62 and 63 to the Cave Creek Complex Fire of 2005.

The CCRRA tract has been evaluated for its eligibility for the National Register of Historic Places using a method that addresses both the tract as a whole and the individual elements, including residential structures, outbuildings, terrain modifications, roads and water systems (Wood, 2007).

By and large the CCRRA remains intact in its original configuration, or at least in the configuration that developed during the later part of its identified period of significance of 1915 to 1959 (Wood, 2007). The road system in particular remains essentially unchanged since 1928 with the sole exception of the asphalt surfacing of that portion of

FR 24 that runs through Middle and Upper Camp Creek. The water systems, particularly the WPA-built Kentuck Spring system, remain remarkably intact. The primary major intrusion is the overhead power and phone line system that serves the individual lots – a sort of necessary part of the evolution of the community and the general raising of the standard of living in all rural settings across the country during the period of significance.

The physical features of the tract also remain relatively intact. While many of the individual structures have strayed from the rustic architectural concept and several tend to dominate the physical environment rather than fitting in to it, lot and structure density have not changed, nor has the layout and arrangement of those lots. The primary alteration of this attribute has been the construction of a number of retaining walls along the creek. Some of these were built to create artificial surfaces on which to construct large and intrusive residences, and these clearly compromise the natural landscape of the tract. Others, in fact, the majority, appear to have been built to protect natural landforms and the residences built on them from the effects of flooding. Given the fact that all of the public campgrounds, all physical features that might have been associated with Lots 21 and 22, and nearly all of whatever once graced Lot 43 were destroyed by flooding, it can be argued that there would be little or nothing left of the CCRRA without them, thus making it difficult to characterize as a particularly adverse effect on the physical environment.

In summary, a total of about 60 features (including building foundations preserved as archaeological sites) out of the more than 299 historic and recent features currently known within the CCRRA can be considered as contributing the eligibility of the tract for inclusion in the National Register of Historic Places. Those contributing elements potentially affected by this decision include:

- 3 Residential structures (Lots 9, 15, and 28)

- 1 garage converted to residential use (Lot 47)

- 11 WPA-built toilets

- The Kentuck Spring water system, in its entirety (springbox, pipeline, trestles, and hydrants)

- 4 cisterns and other surface structures of the Grapevine Springs water system

- CCC-built retaining walls and weirs in Lots 1, 2, 4, 5, 41, 42, 47, and 28 and along Columbine Creek

The native species making up the riparian woodland of Camp Creek remains the dominant vegetation within the CCRRA; the historic setting is still very much in evidence, though various permit holders have introduced a wide variety of exotic species, from planter box flowers to fast-spreading ground covers (e.g. *Vinca*) and shrubs (e.g. Oleander) to Aleppo pines. Nevertheless, the overall appearance of the tract remains that of a Sonoran Desert riparian oasis.

Taken as a whole, then, the CCRRA retains a significant level of integrity of landscape and setting. It also contains a variety of significant historic WPA and CCC-built features that constitute critical elements in the infrastructure that the individual lots depend on. Since there is a considerable level of integrity in several of these elements, the overall character of the tract transcends the fact that so few individual structures on the lots actually contribute to its eligibility. In a sense, though, despite their lack of historic integrity, even the non-eligible structures contribute indirectly to the significance of the tract by establishing the residential character of its setting. Therefore, the Camp Creek

Recreation Residence Area, site AR-03-12-01-1197, in concurrence with the State Historic Preservation Officer for Arizona, has been determined to be eligible for the National Register of Historic Places, though the vast majority of its individual elements do not directly contribute to its eligibility.

Environmental Consequences

Impacts to Heritage resources, especially archaeological and architectural sites, can generally be defined as anything that results in the removal of, displacement of, or damage to structural features, artifacts, or stratigraphic deposits of cultural material, though in the case of the CCRRA, the primary emphasis is necessarily on structural features. In the case of historic properties that are eligible for the National Register of Historic Places, impacts can also include alterations of a property's setting or context. Any such action is seen as having an effect on the integrity and eligibility of the property. If an activity or undertaking alters – directly or indirectly, immediately or in the foreseeable future – any of the characteristics that qualify a property for inclusion in the National Register in such a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling or association with significant historic events, the impact is termed an Adverse Effect under the National Historic Preservation Act, as defined at 36 CFR 800.5(a)1. Examples of Adverse Effects relevant to the CCRRA include the physical destruction of or damage to all or part of the property and change in its use or of the physical features within its natural or cultural setting that contribute to its historic significance.

Given the non-renewable nature of all Heritage resources, especially archaeological and historic sites any portion of them that has been damaged or removed permanently diminishes their cultural and scientific value. Therefore, all effects to Heritage properties are considered cumulative.

Alternative 1 – No Action

This alternative would entail the removal of all above-ground features associated with the residences, including the residences themselves, outbuildings (including the WPA-built toilets), the retaining walls that protect them from flooding and hold the fill they are built on, walkways, bridges, pipelines, etc., with the intention of somehow returning the tract to what is described as a “natural” state.

The CCRRA has been determined, in consultation with the State Historic Preservation Officer for Arizona, to be eligible for inclusion in the National Register of Historic Places. Its eligibility results at least as much from its integrity as a culturally modified landscape as it does from the presence of an assortment of historically significant structures (its “contributing elements”) and secondary historic associations to the WPA and CCC. The contributing elements include three residences and a residence-converted garage, the archaeological remains present on five abandoned lots, a number of stone masonry retaining walls and weirs built by the CCC, 11 WPA-built Depression-Era toilets, several water system features in Grapevine Creek, and the entire Kentuck Spring water system (springbox, pipeline and hydrants), also built by the WPA.

Removal of all structures and other features associated with all currently permitted lots would eliminate most of the characteristics that define the CCRRA and establish its eligibility for the National Register. It would leave behind only the archaeological remains associated with five historically abandoned lots, which would exist without much in the way of any physical context. For all intents and purposes, then, removing all standing

structures and cultural modifications of the landscape within the CCRRA tract effectively destroys the property. This would constitute an Adverse Effect under the National Historic Preservation Act. The only mitigation measures that could be brought to bear in this case would be limited to documentation prior to removal. Since the traditional archaeological treatments – data recovery excavations, artifact collections and analyses, etc. – are not applicable here because the structures and their associated material are not Forest Service property, the only things remaining after removal would be photographic images, drawings, and written descriptions. No physical remains would be left, either on the ground or in curated collections, though it might be possible to retrieve and relocate one of the better-preserved WPA toilets. As a result, the Adverse Effect could not be fully resolved by any mitigation measures that could reasonably be implemented.

Alternative 2 – The Proposed Action

This alternative would allow the permit holders to continue the use and occupation of their lots and residences within the CCRRA under new 20-year permits. Continued use and occupation of the lots would require permit holders to strictly adhere to the architectural and occupancy guidelines established for recreation residences on Forest Service land as specified in these new permits. Roads would be maintained by the permit holders, as would all three of the water systems, which would be brought into compliance with Federal, State and County regulations. The burned residences would be allowed to be rebuilt and new clauses would be added to the permits regulating and restricting activities within the 100-year floodplain.

In addition, all outhouses within the CCRRA would be required to be filled and sealed and all non-native vegetation introduced by the permit holders would be removed by them.

This alternative has at least the potential to affect the historic integrity of the CCRRA tract in several ways. Any modification of the historic road system to meet standards may alter those features, though it is unlikely that this would be considered an Adverse Effect, simply because no foreseeable modifications would result in any significant changes to those roads beyond what has already been done to them.

The filling and sealing of the WPA-built toilets for health and safety reasons would clearly affect the functionality and use of these structures, but this effect can be mitigated by documentation and a requirement that these structures be maintained by the permit holders with no further modification to the exterior fabric or interior features of these buildings.

The removal of non-native vegetation might be considered to affect the setting of the tract as it has developed over the years, but it is, in fact, the introduction of such species that has diminished the setting and feel of the tract from its original condition and subsequent requirements to keep the native vegetative landscape intact. In this instance, the removal of non-native species would help to restore the integrity of the tract and could be informally considered to be a beneficial effect.

While it is not known what modifications would be made to the Kentuck Spring water system, given that they would be mandated by regulatory requirements, the Adverse Effect of altering or replacing components might be resolved through a mitigation program that would record and document the physical characteristics and history of the system and its features. For the purposes of compliance with the NHPA, any proposed modifications would be evaluated as separate undertakings as they are proposed. Over

all, then, it is reasonable to assume that these individual proposals, with mitigation and adherence on the part of the permit holders to prescribed maintenance guidelines, would constitute no more than a No Adverse Effect, as would the Proposed Action alternative as a whole.

Alternative 3 – Restoring Floodplain Function

This alternative proposes that all features identified by Forest Service hydrographic studies as being located within the mathematically determined 100-year floodplain be removed by the permit holders within ten years and those permits terminated. This would include residences, retaining and flood protection walls, bridge piers, water control weirs and presumably the several stone masonry stairways that represent original access routes into many of the lots. The remaining structures located above that level would be allowed to remain under newly issued 20-year permits allowing continued use and occupation of the permitted lots under the same conditions as for the Proposed Action.

Removal of only those features and residences within the 100-year floodplain, even though about half of them would be allowed to remain, would have a serious impact on the physical integrity of the tract. Contained within the area designated for removal are three of the four structures contributing to the eligibility of the property. In addition, only one residence would remain in the Upper Camp Creek unit and less than half would remain in Middle Camp Creek. While the Lower Camp Creek unit would remain relatively intact, one of its two contributing structures would be removed. Such reductions would greatly alter the residential character of the tract, especially in Upper Camp Creek.

Included in the call to remove all structures within the 100-year floodplain are the CCC-built retaining walls associated with Lots 1, 2, 4, 5, 28, 41, 42 and 47 as well as the WPA-built springbox and segments of the pipeline and other features of the Kentuck Water System.

Although no WPA-built toilets are located within the 100-year floodplain, the terms of the 10-year permits to be issued for those lots where the residence is inside this limit will require that all improvements be removed. Under these terms, three of the remaining eleven toilets would have to be removed and the rest filled and sealed, as in Alternative 2.

The CCC and WPA associated features are character-defining elements of the CCRRA tract that contribute to its eligibility. They not only help to create the setting of the property but also tie it to historic events of National significance and so are significant in their own right.

By removing contributing elements, altering the residential and cultural setting along Camp Creek, and removing critical features having strong associations with the CCC and WPA, implementing this alternative would severely diminish the National Register eligibility of the property and have nearly as much of an Adverse Effect on the tract as Alternative 1.

The only mitigation measures that could be brought to bear under this alternative would be limited to documentation prior to removal. Since the traditional archaeological treatments – data recovery excavations, artifact collections and analyses, etc. – are not applicable here because the structures and their associated material are not Forest Service property, the only things remaining after removal would be photographic images, drawings and written descriptions. No physical remains would be left, either on the ground or in curated collections, though it might be possible to retrieve and relocate one

of the better preserved WPA toilets. As a result, the Adverse Effect could not be fully resolved by any mitigation measures that could reasonably be implemented.

Mitigation Measures:

The mitigation methods outlined in Chapter 2 will result in a determination of No Adverse Effect for the proposed alternative. They will help to resolve the effects of alternatives 1 and 3 but will not reduce them. Implementation of either of these alternatives will result in a determination of adverse effect.

Landscape Management

The primary goal of landscape management is to manage National Forest System lands to attain the highest possible quality of landscape aesthetics and scenery commensurate with other appropriate public uses, costs and benefits. A key objective related for this project is to minimize duration or intensity of alterations that contrast with the natural character of the landscape.

Introduction

There is one recreation residence tract with 44 established recreation residences lots on the Cave Creek Ranger District of the Tonto National Forest. Several structures date back to 1942, which demonstrates a long period of established use. The tract is broken into several units: (1) Columbine – five lots; (2) Upper Camp Creek – seven lots; (3) Middle Camp Creek – ten lots; (4) Lower Camp Creek – 18 lots and (5) Grapevine – four lots. Recently, conditions changed for several lots. The Cave Creek Complex Fire of 2005 entirely destroyed 11 recreation residences and affected outbuildings on five other lots. One permit holder has decided to voluntarily terminate their permit.

Analysis Area

The analysis area as it relates to landscape management encompasses the seen area from key viewpoints. Key viewpoints include the seen area from Forest Road 24 and individual recreation residences. The seen area of highest concern includes the immediate foreground, within ¼ mile of the observer, a distance at which detail can be perceived. Because of topography and physical limits of the recreation tract, middle and background views were not included in the analysis of visual resources.

Tonto National Forest Management Unit 1F - Manage for VQO's ranging from retention to maximum modification according to the following guidelines:

Table 3-31. Management Area 1F Percent of VQO

	Percent of Management Area
Retention	9
Partial Retention	16
Modification	24
Maximum Modification	51

Analysis Methods

The analysis of visual resources within the project area included review of existing visual resource inventories and site reviews to verify applicability of inventoried Visual Quality Objectives (VQO).

Affected Environment

Current Visual Quality Objectives (VQO) applicable within the project limits are as follows:

Table 3-32. Existing VQO Coverage within Project Area

Visual Quality Objective	VQO Geographic Distribution	Approximate Percentage of Project Area
Retention	Eastside FDR 24 & 24F / Upper, Middle and Lower Camp Creek sub-units	60%
Partial Retention	Westside FDR 24 / Grapevine & Columbine sub-units	40%

Retention (R) – A Visual Quality Objective that in general means man's activities are not evident to the casual forest visitor. Contrasts to natural form, line, color, and texture should be reduced during operations or immediately after.

Partial Retention (PR) – A Visual Quality Objective that in general means man's activities may be evident but remain subordinate to the characteristic landscape. Contrasts to natural form, line, color, and texture should be reduced as soon after project completion as possible or at a minimum within the first year.

The entire analysis area is contained within the Sonoran Arizona Uplands Landscape Character Subtype. This landscape type occupies the southwest portion of the TNF extending along the southern boundary. The overall appearance is of varied terrain with isolated peaks or peaks with distinctive forms and color contrast that become focal points.

The locally dominant physiographic feature is Camp Creek, which forms the central focus of the recreation residence tract. Camp Creek extends beyond the project limits and provides strong focal orientation throughout the area. Vegetative patterns within the project area include strongly defined pattern combinations of Saguaro and Palo Verde, stringers of riparian vegetation along with barren soil and rock. This unique setting includes landform, vegetation, water, and rock formations of unusual and outstanding visual quality. The natural landscape appears mostly intact with the exception of areas disturbed by access roads and building footprints. Localized negative impacts to the natural character of the area include the introduction of non-native vegetation and modification to natural vegetation patterns.

The Camp Creek landscape also features a built environment typical of 1940s forest recreation residences. The overall layout of the tract is focused around Camp Creek and recreation residences are perched on benches or cut into hillsides overlooking the riparian corridor. The degree to which individual recreation residences blend with the surrounding landscape varies. The smaller scale recreation residences that exhibit the use of natural materials and rustic details harmonize more with the surrounding landscape. Recreation residences with extensive modifications to their original design tend to contrast with the surrounding landscape. Many residences properties are not maintained, which has a negative visual affect on the landscape.

The applicable visual resource guidelines for Management Unit 1F are not being met. Within the Grapevine & Columbine sub-units, the VQO of Partial Retention is currently not being achieved due to the burned structures and unsightliness of the recreation

residence properties. Within the Upper, Middle and Lower Camp Creek sub-units, the VQO of Retention currently is not being fully achieved due to the visibility of recreation residences within the seen foreground of Forest Roads 24 and 24F and the unsightliness of the properties.

Environmental Consequences

Common to All Alternatives

Achievement of the Partial Retention VQO within the Grapevine & Columbine sub-units would be made after the burned homes are replaced. In addition, Partial Retention VQO would be achieved after the ten and 20-year permit period following implementation of the updated operation and maintenance (O & M) plans. Conflicts with achieving the Retention VQO would be reduced after the ten and 20-year permit period following implementation of the updated operation and maintenance (O&M) plans. Achievement of the Retention VQO would be accomplished following the removal of structures and rehabilitation of disturbed areas.

The permit operation and maintenance (O&M) plan would be updated to include additional direction and information related to visual resource management and have the direct effect of minimizing visual contrast of recreation residences with characteristics of the surrounding landscape:

- Architectural guidelines to establish standards for building and structure materials, colors and type.
- Vegetative screening of Upper Middle, and Lower Camp Creek from Forest Roads 24 and 24F.
- Recommend native plant species for landscaping.
- Removal and maintenance of non-native plant species.

Alternative 1 – No Action

In order to receive a 10-year permit, permit holders would need to fully comply with county, state and federal law, regulation and policy and the terms of associated permits.

Table 3-33. No Action Alternative Visual Effects

Visual Effects – No Action Alternative
Direct and Indirect Effects
Achievement of Partial Retention after ten-year period
Achievement of Retention after ten-year period

Alternative 2 – Proposed Action

This alternative proposes to renew 43 recreation residence term special use permits for a 20-year period. The alternative includes direction and requirements for rebuilding ten residences that were destroyed by fire. In addition, tract-wide direction on specific requirements (mitigation) needed to fully comply with county, state and federal law, regulation and policy (the terms of the special use permit) would be provided.

Table 3-34. Proposed Action Alternative Visual Effects

Visual Effects – Proposed Action
Direct and Indirect Effects
Achievement of Partial Retention after 20-year period
Reduced conflict with Retention after 20-year period

Alternative 3 – Modified Proposed Action

The alternative would move the recreation residence tract closer to the Forest Plan Management Area 1F watershed, riparian and wildlife habitat resource objectives.

Table 3-35. Modified Proposed Action Alternative Visual Effects

Visual Effects – Modified Proposed Action
Direct and Indirect Effects
Achievement of Partial Retention (inside floodplain) after ten-year period
Reduced conflict with Retention (outside floodplain) after 20-year period
Achievement of Retention (inside floodplain) after ten-year period

Cumulative Effects

Past, present and reasonably foreseeable activities were reviewed to determine potential cumulative effects to visual resources associated with the recreation residences tract. The cumulative effects analysis area as it relates to landscape management encompassed the seen area from key viewpoints. Key viewpoints include the seen area from Forest Road 24 and individual recreation residences. The seen area of highest concern includes the immediate foreground, within ¼ mile of the observer, a distance at which detail can be perceived. Because of topography and physical limits of the recreation tract, middle and background views were not included.

Since establishment of the tract visual resources have been directly affected by the construction, occupancy and maintenance of individual recreation residences and associated infrastructure. A pattern of increased development has resulted in the accumulation of contrasting elements, including recreation residences, roads, waterlines, utility corridors and introduction of non-native vegetation, to the natural landscape thereby reducing the overall scenic quality of the area.

Public sensitivity towards the visual resources has also increased since establishment of the recreation residence tract. Improved access to the area has resulted in increased numbers of forest users drawn to this riparian setting. Expected paving of Forest Road 24 will further increase visitation to the area and heighten public sensitivity to the state of scenic qualities within the Camp Creek corridor of Forest Road 24.

The cumulative effects of development and public access will continue to influence the visual resources associated with the recreation residence tract. Application of visual

management guidelines contained in the proposed new O&M plan will maintain VQO within an acceptable range prior to the permanent removal of structures and reclamation of the project area.

Mitigation Measures

Table 3-37. Allowable Duration of Visually Contrasting Affects

Visual Quality Objective	Allowable duration of impacts contrasting to natural landscape character
Retention	Immediately following operations
Partial Retention	Within first year following operations

Common to All Alternatives

Combination of adequate screening, natural materials, and earth tones should be used to reduce contrasts to natural form, line, color and texture of the surrounding landscape as seen from key viewpoints.

New Construction, Repair and Renovation

Vegetation Management:

- Plant vegetative buffer to screen of Upper, Middle, and Lower Camp Creek from Forest Roads 24 and 24F.
- Plant native vegetation appropriate to the area.
- Remove non-native vegetation.
- Prune trees and shrubs to maintain natural form.
- Remove or flush-cut stumps within seen foreground.
- Remove slash within seen foreground.

Earthwork and Grading:

- Blend cut-and-fill slopes into adjacent natural topography.
- Flatten constructed slopes to the maximum amount practicable.
- Re-contour disturbed areas to mimic adjacent landforms.
- Seed (native mix) and stabilize (erosion and sediment control) disturbed soils.

Structures and Roads:

- Construct roads with minimal cut and fill slopes.
- Maximize vegetative screening of buildings as seen from key viewpoints.
- Limit scale of recreation residences and outbuildings to sizes adequate for intermittent occupancy.
- Utilize colors and materials that blend with the surrounding landscape.

3.9 Noxious Weeds

Environmental Consequences

Since removal of non-native plants is common to all alternatives, and all noxious weeds on the Tonto fall into that category, environmental consequences of implementing any of the alternatives is basically the same with regard to noxious weeds. Conditions conducive to establishment and growth of native riparian species should improve.

Cumulative effects common to all alternatives:

The Cave Creek District has been requiring removal of some invasive plants already, as an administrative action. A decision memo signed in 2006 provides for manual removal of weeds, or use of prescribed fire near roads, in blocks of ten acres or less throughout the Tonto National Forest. The Camp Creek EA does not evaluate use of herbicides. The forest-wide Environmental Assessment for treatment of invasive and noxious weeds, which is due to be completed this fiscal year, evaluates the proposal of using a full range of techniques to remove invasive plant species, including herbicides. A decision to implement this alternative will be necessary before the third feature common to all alternatives in the Camp Creek EA may be conducted; that is, removal of non-native vegetation manually and with use of an approved herbicide.

Implementation of manual and herbicidal removal of listed noxious weeds Vinca, Jerusalem thorn, oleander, tree of heaven, Arundo, English ivy, yellow sweetclover, buffelgrass and pyracantha will allow native riparian vegetation to move back into habitat it would normally occupy along the Camp Creek riparian area and associated upland slopes. Funding was obtained in 2007 for a project to collect native seed from species in the general vicinity of Camp Creek, to use to grow out and revegetate riparian areas and slopes after removal of invasive plant species. This is to be done as a joint project, in cooperation with residence owners helping to remove the invasive species and also to assist with establishment of newly planted native plants.

Environmental Consequences for Alternatives 2 and 3

Residence owners would be required to remove non-native plants on their lots. Many of the invasive plants are growing along Camp Creek itself, and are not on any residential lot. Removal of invasive plants would need to be a cooperative effort between the homeowners and the Forest Service.

If the homeowners are educated in identification of noxious weeds that are likely to infest the area of Camp Creek, and are willing to work as partners with the Forest, they could provide an early detection network for finding and removing infestations of invasive plants while they are still small.

It is possible for homeowners to inadvertently introduce invasive species, just as the general public could in alternative 1; however the number of homeowners is much smaller than the number who would frequent the area if it were opened up to the general public.

Environmental Consequences for Alternatives 1 and 3

This alternative calls for extensive ground-disturbing activities with required removal of all residences and facilities before the end of ten years. Modifying the use of this area to dispersed recreation will allow many more people from the greater metropolitan area to

have access to this part of Camp Creek, which has been essentially closed to the public for a long time. There will most probably be an increase in infestations of invasive plant species common in the heavily populated area of Phoenix, such as buffelgrass, fountain grass and *Malva starthistle*. A riparian area so close to town will be very popular, and will probably be heavily used. Any soil disturbance caused by vehicles, animals, or foot traffic will increase the chances of invasive species becoming established.

Chapter 4 – Preparers and Contributors

The Forest Service consulted the following individuals, federal, state and local agencies and non-Forest persons during the development of this environmental assessment:

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Appendix B – Firewise Landscaping Checklist

When designing and installing a firewise landscape, consider the following:

- Local area fire history.
- Site location and overall terrain.
- Prevailing winds and seasonal weather.
- Property contours and boundaries.
- Native vegetation.
- Plant characteristics and placement (duffage, water and salt retention ability, aromatic oils, fuel load per area, and size).
- Irrigation requirements.

To create a firewise landscape, remember that the primary goal is fuel reduction. To this end, initiate the zone concept. Zone 1 is closest to the structure; Zones 2-4 move progressively further away.

Zone 1. This well-irrigated area encircles the structure for at least 30' on all sides, providing space for fire suppression equipment in the event of an emergency. Plantings should be limited to carefully space low flammability species.

Zone 2. Low flammability plant materials should be used here. Plants should be low-growing, and the irrigation system should extend into this section.

Zone 3. Place low-growing plants and well-spaced trees in this area, remembering to keep the volume of vegetation (fuel) low.

Zone 4. This furthest zone from the structure is a natural area. Selectively prune and thin all plants and remove highly flammable vegetation.

Also remember to:

- Be sure to leave a minimum of 30' around the house to accommodate fire equipment, if necessary.
- Widely space and carefully situate the trees you plant.
- Take out the “ladder fuels” — vegetation that serves as a link between grass and treetops.
- This arrangement can carry fire to a structure or from a structure to vegetation.
- Give yourself added protection with “fuel breaks” like driveways, gravel walkways and lawns.

When maintaining a landscape:

- Keep trees and shrubs properly pruned. Prune all trees so the lowest limbs are 6' to 10' from the ground.
- Remove leaf clutter and dead and overhanging branches.
- Mow the lawn regularly.
- Dispose of cuttings and debris promptly, according to local regulations.

- Store firewood away from the house.
- Be sure the irrigation system is well maintained.
- Use care when refueling garden equipment and maintain it regularly.
- Store and use flammable liquids properly.
- Dispose of smoking materials carefully.
- Become familiar with local regulations regarding vegetation clearances, disposal of debris, and fire safety requirements for equipment.
- Follow manufacturers' instructions when using fertilizers and pesticides.

Access additional information on the Firewise home page: www.firewise.org

Firewise Construction Checklist

When constructing, renovating, or adding to a firewise home, consider the following:

- Choose a firewise location.
- Design and build a firewise structure.
- Employ firewise landscaping and maintenance.

To select a firewise location, observe the following:

- Slope of terrain; be sure to build on the most level portion of the land, since fire spreads more rapidly on even minor slopes.
- Set your single-story structure at least 30 feet back from any ridge or cliff; increase distance if your home will be higher than one story.

In designing and building your firewise structure, remember that the primary goals are fuel and exposure reduction. To this end:

- Use construction materials that are fire-resistant or non-combustible whenever possible.
- For roof construction, consider using materials such as Class-A asphalt shingles, slate or clay tile, metal, cement and concrete products or terra-cotta tiles.
- Constructing a fire-resistant sub-roof can add protection as well.
- On exterior wall facing, fire resistive materials such as stucco or masonry are much better choices than vinyl, which can soften and melt.
- Window materials and size are important. Smaller panes hold up better in their frames than larger ones. Double pane glass and tempered glass are more reliable and effective heat barriers than single pane glass. Plastic skylights can melt.
- Install non-flammable shutters on windows and skylights.
- To prevent sparks from entering your home through vents, cover exterior attic and under floor vents with wire screening no larger than 1/8-inch mesh. Make sure under-eave and soffit vents are as close as possible to the roofline. Box in eaves, but be sure to provide adequate ventilation to prevent condensation.

- Include a driveway that is wide enough to provide easy access for fire engines (12 feet wide with a vertical clearance of 15 feet and a slope that is less than five percent). The driveway and access roads should be well maintained, clearly marked, and include ample turnaround space near the house. Also provide easy access to fire service water supplies, whenever possible.
- Provide at least two ground level doors for easy and safety exit and at least two means of escape (i.e., doors or windows) in each room so that everyone has a way out.
- Keep gutters, eaves, and roofs clear of leaves and other debris.
- Make periodic inspections of your home, looking for deterioration such as breaks and spaces between roof tiles, warping wood, or cracks and crevices in the structure.
- Periodically inspect your property, clearing dead wood and dense vegetation at distance of at least 30 feet from your house. Move firewood away from the house or attachments like fences or decks.

Any structures attached to the house, such as decks, porches, fences and outbuildings should be considered part of the house. These structures can act as fuel bridges, particularly if constructed from flammable materials. Therefore, consider the following:

- If you wish to attach an all-wood fence to your house, use masonry or metal as a protective barrier between the fence and house.
- Use metal when constructing a trellis and cover it with high-moisture, low flammability vegetation.
- Prevent combustible materials and debris from accumulating beneath patio decks or elevated porches. Screen or box-in areas below patios and decks with wire screen no larger than 1/8-inch mesh.
- Make sure an elevated wooden deck is not located at the top of a hill where it will be in direct line of a fire moving up slope. Consider a terrace instead.

Access additional information on the Firewise home page: www.firewise.org

Appendix C – Scoping Comments Dismissed

Table D-1. Scoping Comments Dismissed and Response

Comment	Response to the Comment
At one place you state that septic systems may be constructed off the permitted lot and that "a special use permit would be issued authorized the off-lot use". We believe that lots could be resurveyed and septic systems be authorized as improvements on the term permits rather than issuing two permits to affected permittees.	Whether to issue one permit or two for the septic system would be an administrative decision. This analysis will make a decision on whether to allow for off-lot septic systems.
The scoping letter states that a condition of renewal would be that occupancy of residences would not be allowed during a forest-wide fire closure. We believe that this condition, as written, is not in the best interest of the homeowners or the Forest Service. We would recommend revision or elimination of the condition in the EA.	Thank you for your comment. The analysis will address the effect of such a closure to the homeowners. The Responsible Official will consider any impacts and decide whether to implement this action or not.
..I understood in the meeting that it was stated that the extra space needed for the system would be added to our lot.	Thank you for your comment. For clarification, the decision to be made would determine whether systems would be allowed off-lot.
We are concerned that the description confuses the decision to allow rebuilding following fire with the decision to issue new permits upon expiration of the term. These are different types of decisions, covered in different sections of the applicable regulations. What the existing recreation residences must do to obtain a new permit is different from what the structures that have to rebuild must do.	Thank you for your comment. While we will clarify the decisions to be made, the amount of time and resource specialists needed to complete the environmental analysis does not allow for two separate analyses. For actions related to both the burned recreation residences and permit renewal, the decision would have to be made that the actions are consistent with the Tonto Forest Plan management direction. Finally, since the need to renew permits is now imminent, the action are considered "connected" or closely related (CEQ 1508.25). There are actions that are interdependent parts of a larger action and depend on the larger action for their justification.
As to the requirements for reconstruction, we remain concerned that some of these items will be onerous for the permit holders who wish to rebuild. Of particular concern is the requirement that all remnant water systems be abandoned. That could leave the permit holder without water to their recreation residence. While we hope that is not the intent of the decision, we believe the notice could be read in this manner and needs to be reworded to avoid such a draconian application.	Thank you for your comment. The sentence reads, "all abandoned septic and water systems would need to be in compliance with county code". This refers to permit holders choosing the abandon septic and water systems in favor of new alignments, etc. that are required for building. Meeting county code would be necessary.

Comment	Response to the Comment
<p>The commingling of the decision to allow rebuilding of the recreation residences with the list of conditions for the rest of the recreation residences to receive new permits results in a notice that may be unnecessarily confusing and mislead those who wish to express their concerns over the list of requirements for the new permit. Some of the conditions may result in practical problems on the ground, and in this notice, appearing only to cover the burned recreation residences..may not be seen by the affected group as something that will affect them.</p>	<p>Thank you for your comment. We will clarify what conditions apply only to the burned recreation residences and what conditions apply tract-wide.</p>
<p>We believe that the recreation residences destroyed in the fire should be allowed to be rebuilt. The forest plan appears to anticipate that the places where the affected tract existed were in appropriate locations. If this is the case, then there does not appear to be a need for the forest plan to be amended.</p>	<p>Thank you for your comment. Once the alternatives are finalized and the effects analysis completed, we will identify if a Forest Plan amendment is needed.</p>

Appendix D – Monitoring

Table D-2. Monitoring of Mitigation Measures

No.	Mitigation Measure	Why	Responsible Party
Heritage			
H1	Leave all archaeological remains from abandoned lots, abandoned recreation sites, and earlier historic occupations in place (Lots 12, 43, 44, 45, 59, & 69). All Alternatives	To preserve some physical remnants of the CCRRA for future study and interpretation.	Archaeologist, Permit Administrator/annually or during inspections
H2	Document all features to be removed with photography and drawings; attempt to document the demolition of those residences listed as contributing elements (Lots 9, 15, 28, & 47 garage) and those residences identified as likely having incorporated earlier historic structures (Lots 2, 5, 16, 45, & 47 residence). Alternatives 1 & 3	To recover as much information about the CCRRA as an historic property as possible without preservation in place.	Archaeologist/annually
H3	Document with photography and drawings (as necessary) all WPA-built toilets scheduled for filling and sealing. Ensure that permit holders maintain them sufficiently to minimize weathering and other deterioration. Alternative 2	To preserve some physical remnants of the CCRRA for future study and interpretation and reduce the impact of their modification to the level of No Adverse Effect.	Permit Administrator/annually and as needed
H4	Inspect and document with photography and drawings (as necessary) all WPA-built toilets scheduled for removal. Select at least one for removal (privy, riser, and concrete vault cap/floor) and relocation to be refurbished as an interpretive display. Alternatives 1 & 3	To preserve some physical remnants of the CCRRA for future study and interpretation.	Archaeologist/as needed

Wildlife and Aquatics			
W1	Rehabilitate and maintain mixed broad leaf riparian to achieve 80% of the potential overstory crown coverage. Natural and / or artificial regeneration, depending on site characteristics. Permit large woody material (dead / down) to remain within Camp Creek and in adjacent riparian and upland areas. All Alternatives	Goal of 80% potential overstory crown coverage is identified in Tonto Forest Plan (1985) as Management Prescription for all riparian areas on the Tonto Forest. Large woody material permitted to remain within the creek and adjacent riparian / upland areas to facilitate development of complex aquatic and terrestrial habitats and nutrient cycling. Intent is to improve riparian / aquatic habitats and ecosystem function.	Riparian Ecologist/annually
W2	Maintain minimum of 30% effective ground cover for watershed protection and forage production. All Alternatives	Identified in Tonto Forest Plan (1985) as Management Prescription for all management areas on the Tonto Forest. Improve ground cover for watershed protection, wildlife habitat and forage production.	Riparian Ecologist/District Biologist/annually
W3	Remove non-native / invasive plants. All Alternatives. *NOTE: more appropriate in Nonnative/invasive mitigation section.	To reduce potential for non-native / invasive plant proliferation, which will lead to re-establishment of native plants, improved ecosystem function and improved wildlife habitats.	Invasive Species Coordinator/as needed

Non-native Invasive Species			
IS1	Require any equipment working in the Camp Creek area to be free of all soil and plant parts when it is brought in.	Prevention of new infestations	Permit Administrator/ as needed
IS2	Require weed-free straw and/or mulch in any restoration work.	Prevention of new infestations	Permit Administrator/as needed
IS3	Have seed lots checked by a state lab for the Tonto's list of invasive plants before it is mixed for use to revegetate disturbed areas.	Prevention of new infestations	Invasive Species Coordinator/annually assess

IS4	Follow best management practices, and all conservation measures in the Forest Weed EA, when working with herbicides.	Safety and health of National Forest workers and the public	Invasive Species Coordinator/annually or as needed
IS5	Any soil brought into the area must be from a site that has been inspected for weeds and found to be free of any weeds on the Tonto noxious weed list.	Safety and health of National Forest workers and the public	Invasive Species Coordinator/annually or as needed

Visuals			
V1	Combination of adequate screening, natural materials, and earth tones should be used	to reduce contrasts to natural form, line, color, and texture of the surrounding landscape as seen from key viewpoints.	Landscape Architect/annually
V2	Vegetation Management: Plant vegetative buffer to screen of Upper, Middle, and Lower Camp Creek from Forest Roads 24 and 24F.	to reduce contrasts to natural form, line, color, and texture of the surrounding landscape as seen from key viewpoints.	Landscape Architect/annually
V3	Earthwork and Grading: Blend cut and fill slopes into adjacent natural topography	to reduce contrasts to natural form, line, color, and texture of the surrounding landscape as seen from key viewpoints.	Landscape Architect/Engineering/annually
V4	Structures and Roads: Construct roads with minimal cut and fill slopes	to reduce contrasts to natural form, line, color, and texture of the surrounding landscape as seen from key viewpoints.	Engineering/annually

Appendix E- Forest Plan Consistency

RECREATION

Alternatives 1 through 3

The Forest Plan emphasizes recreation diversity and supply (USDA-FS, 1985). During the last Forest planning process the demand for developed recreation opportunities and declining dispersed recreation opportunities were identified as public issues and management concerns. Demand for developed recreation opportunity exceeds supply. Quality of dispersed recreation opportunities is declining (Forest Plan, Public Issues and Management Concerns, p. 8). The mission statement of the plan includes providing a quality mix of year round outdoor recreation experience opportunities for personal enjoyment ranging from developed recreation sites to wilderness experiences (Forest Plan p. 19). With the wealth of cultural resources on the Tonto National Forest, opportunities exist to provide interpretation of prehistoric and historic sites as a developed recreation experience (Forest Plan, Public Issues and Management Concerns, p. 8). The Forest Plan emphasizes providing new sites forest wide at popular areas of high existing or potential use. The need for developed recreation sites will continue to increase as the Phoenix metropolitan area grows.

The Forest Plan Goals and Management Area Emphasis relating to dispersed recreation are as follows:

- Maintain and enhance visual resource values by emphasizing attainment of recreation resource management that will increase opportunities for a variety of developed and dispersed experiences.
- Provide those developed sites needed to meet most of the public demand and to support dispersed visitor use.
- Manage for a variety of renewable natural resources with primary emphasis on wildlife habitat improvement, livestock forage and dispersed recreation.
- The No Action alternative partially meets the Forest Plan Goals and Management Area Emphasis for dispersed recreation opportunities, but lacks in providing for valuable interpretive opportunities of the riparian community and history of the area.
- Dispersed recreational use of Grapevine and Columbine for bird watching and hunting would likely increase once the area is returned to natural condition as the area would then provide additional cover, forage and water for birds and game and the absence of occupied structures would make hunting in the area legal.
- Forest Road 3207 accessing lower Camp Creek would be gated and closed to public motorized access. Public pedestrian access for general dispersed recreation would be allowed within the recreation residence tract, and the area would experience an increased dispersed recreational use of hiking, picnicking and bird watching along Camp Creek. However, no recreation improvements, facilities or interpretation would be provided under the No Action alternative. Valuable interpretative opportunities of the unique riparian community and history of the area would be lacking in this alternative.

All alternatives would continue to meet the ROS standards for Roaded Natural areas.

Alternative 3

Under this Alternative there will be somewhat more recreation opportunities than in Alternative 2, but less than Alternative 1 would provide. The public perception that the area is off-limits will be reinforced with the reconstruction activities in Columbine and Grapevine.

Valuable interpretative opportunities of the unique riparian community and history of the area would be lacking.

SOCIAL AND ECONOMIC ANALYSIS

Alternatives 1 through 3

The Forest Plan speaks to neither the social nor economic sphere for recreation residence use.

WATER RESOURCES

Alternative 1

Some of the management prescriptions identified in the Forest Plan and listed in the Regulatory Framework section of this report will not be met during the first ten years. Management direction to maintain 30 percent effective ground cover will not be met where measures to reduce fire hazard around recreation residences are implemented and where other surface disturbing activities occur.

Disturbance to stream channels and riparian vegetation would continue for ten years where residences and associated structures encroach into the channel and floodplain. These impacts would be reduced following restoration although cut and fill slopes of FR 24 would continue to encroach into the channel and floodplain in the Upper and Middle Camp Creek Recreation Residence Area.

Constructed low water crossings would continue to serve as barriers to fish movement until these structures are removed.

Alternative 2

Some of the management prescriptions identified in the Forest Plan and listed in the Regulatory Framework section of this report will not be met under this alternative. Management direction to maintain 30 percent effective ground cover will not be met where measures to reduce fire hazard around recreation residences are implemented and where other surface disturbing activities occur.

Disturbance to stream channels and riparian vegetation would continue where roads, residences, and associated structures encroach into the channel and floodplain.

Constructed low water crossings would continue to serve as barriers to fish movement.

Alternative 3

Some of the management prescriptions identified in the Forest Plan and listed in the Regulatory Framework section of this report will not be met. Management direction to maintain 30 percent effective ground cover will not be met where measures to reduce fire hazard around recreation residences are implemented and where other surface disturbing activities occur.

Disturbance to stream channels and riparian vegetation would continue for up to ten years where residences and associated structures encroach into the channel and floodplain. These impacts would be reduced following restoration although cut and fill

slopes of FR 24 would continue to encroach into the channel and floodplain in the Upper and Middle Camp Creek Recreation Residence Area.

Constructed low water crossings would continue to serve as barriers to fish movement until these structures are removed.

WILDLIFE AND FISHERIES

Alternative 1

The Tonto National Forest Plan identifies management direction for wildlife and fish as follows; “Wildlife and fish habitat elements will be recognized in all resource planning and management activities to assure coordination that provides for species diversity and greater wildlife and fish populations through improvement of habitat. Ensure that fish and wildlife habitats are managed to maintain viable populations of existing native vertebrate species (USDA-FS, 1985, pp. 20).”

Management prescriptions within the Tonto National Forest Plan are identified as “management practices selected and scheduled for application on a specific area to attain multiple use and other goals and objectives [36 CFR 219.3(u)] (USDA 1985, p 35 of 257).”

This alternative was also evaluated to determine if expected outcomes would meet Forest Plan direction for aquatic and terrestrial wildlife, or habitats that may support such wildlife.

Management Prescriptions that relate to aquatic and terrestrial wildlife resources within the project area include the following:

- Locate and survey all potential Gila topminnow sites. Where feasible stock sites, monitor success, and restock if necessary (USDA-FS, 1985, pp. 40). This alternative would allow for stocking of Gila topminnow into Camp Creek, although surface flows may be reduced for up to ten more years and water quality may be affected by septic systems. Riparian development, which would provide additional stream bank stabilization, would be impacted for up to ten years. Once homes, septic systems, roads were removed and naturalized, and provided sufficient time to establish vegetation, this prescription could be met.
- Maintain a minimum of 30 percent effective ground cover for watershed protection and forage production, especially in primary wildlife forage producing areas. Where less than 30 percent exists, it will be the management goal to obtain a minimum of 30 percent effective ground cover (USDA-FS, 1985, pp. 40). For up to ten years, ground cover may be less than 30 percent due to lot maintenance and fuel reduction efforts along Camp Creek. This prescription could be met once homes, septic systems and roads were removed and naturalized.
- Rehabilitate and maintain, through improved management practices, mixed broad leaf riparian to achieve 80 percent of the potential overstory crown coverage. Natural regeneration is anticipated to achieve most of this goal. Artificial regeneration may be necessary in some areas (USDA-FS, 1985, pp. 41). This prescription would not be met for up to ten years within Camp Creek due to fuel reduction on lots, displaced riparian habitat and hardening of surfaces (roads, driveways, parking areas). This prescription may be met, once riparian development was achieved in areas currently occupied by homes and associated infrastructure. Time required to achieve 80 percent of the potential overstory crown coverage, would be dependant upon extent of rehabilitation on lots, and associated infrastructure.

- Where channel crossings are necessary, select an area where the channel is straight and cross the channel at right angles (USDA-FS, 1985, pp. 43). This prescription would not be met for up to ten years due to existence of driveways and roads crossing Camp Creek at various angles. This prescription could eventually be met once roads and driveways were removed and naturalized.
- Avoid channel changes or disturbance of stream channels and minimize impacts to riparian vegetation (USDA-FS, 1985, pp. 43). This prescription would not be met for up to ten years due to roads crossing Camp Creek. In addition there has been a channel change in the area where the driveway for recreation residences 29 and 30 cross Camp Creek. In this area the driveway has captured the stream and created a side channel. The prescription could be met once roads were removed and the impacted area naturalized.
- Maintain, improve and protect the desert scrub type to emphasize production of javelina, Gambel's quail and mule deer (USDA-FS, 1985, pp. 68). This prescription would not be met for up to ten years due to displacement of upland habitat by residences and associated infrastructure. In ten years, once homes and infrastructure are removed and naturalized, desert scrub habitat could improve.

Alternative 2

The Tonto National Forest Plan identifies management direction for wildlife and fish as follows; "Wildlife and fish habitat elements will be recognized in all resource planning and management activities to assure coordination that provides for species diversity and greater wildlife and fish populations through improvement of habitat. Ensure that fish and wildlife habitats are managed to maintain viable populations of existing native vertebrate species (USDA-FS, 1985, pp. 20).

Management prescriptions within the Forest Plan are identified as "management practices selected and scheduled for application on a specific area to attain multiple use and other goals and objectives [36 CFR 219.3(u)] (USDA-FS, 1985, pp. 35)."

This alternative was also evaluated to determine if expected outcomes would meet Forest Plan direction for aquatic and terrestrial wildlife, or habitats that may support such wildlife.

Management Prescriptions that relate to aquatic and terrestrial wildlife resources within the project area include the following:

- Locate and survey all potential Gila topminnow sites. Where feasible stock sites, monitor success, and restock if necessary (USDA-FS, 1985, pp. 40).

This alternative would allow for stocking of Gila topminnow into Camp Creek, although surface flows may be reduced for up to 20 more years, due to domestic use of springs. Riparian development, which would provide additional stream bank stabilization, would be impacted for at least 20 more years by reduced surface flow. Reduced flows within Camp Creek could reduce the potential for Gila topminnow to occupy Camp Creek over time.

- Maintain a minimum of 30 percent effective ground cover for watershed protection and forage production, especially in primary wildlife forage producing areas. Where less than 30 percent exists, it will be the management goal to obtain a minimum of 30 percent effective ground cover (USDA-FS, 1985, pp. 40). For at least 20 years,

ground cover may be less than 30 percent due to lot maintenance and fuel reduction efforts along Camp Creek, Columbine and Grapevine.

- Rehabilitate and maintain, through improved management practices, mixed broad leaf riparian to achieve 80 percent of the potential overstory crown coverage. Natural regeneration is anticipated to achieve most of this goal. Artificial regeneration may be necessary in some areas (USDA-FS, 1985, pp. 41). This prescription would not be met for at least 20 years due to fuel reduction on lots, displaced riparian habitat and hardening of surfaces (roads, driveways, parking areas).
- Where channel crossings are necessary, select an area where the channel is straight and cross the channel at right angles (USDA-FS, 1985, pp. 43). This prescription would not be met for at least 20 years due to existence of driveways and roads crossing Camp Creek at various angles.
- Avoid channel changes or disturbance of stream channels and minimize impacts to riparian vegetation (USDA-FS, 1985, pp. 43). This prescription would not be met for more than 20 years due to roads crossing Camp Creek and the Grapevine tributary. In addition there has been a channel change in the area where the driveway for recreation residences 29 and 30 cross Camp Creek. In this area the driveway has captured the stream and created a side channel. The prescription could be met if roads were removed and the impacted area naturalized.
- Maintain, improve and protect the desert scrub type to emphasize production of javelina, Gambel's quail and mule deer (USDA-FS, 1985, pp. 68). This prescription would not be met for at least 20 years due to displacement of upland habitat by residences and associated infrastructure.

Alternative 3

The Forest Plan identifies management direction for wildlife and fish as follows; "Wildlife and fish habitat elements will be recognized in all resource planning and management activities to assure coordination that provides for species diversity and greater wildlife and fish populations through improvement of habitat. Ensure that fish and wildlife habitats are managed to maintain viable populations of existing native vertebrate species (USDA-FS, 1985, pp. 20)."

Management prescriptions within the Forest Plan are identified as "management practices selected and scheduled for application on a specific area to attain multiple use and other goals and objectives [36 CFR 219.3(u)] (USDA-FS, 1985, pp. 35)."

This alternative was also evaluated to determine if expected outcomes would meet Forest Plan direction for aquatic and terrestrial wildlife, or habitats that may support such wildlife.

Management Prescriptions that relate to aquatic and terrestrial wildlife resources within the project area include the following:

- Locate and survey all potential Gila topminnow sites. Where feasible stock sites, monitor success and restock if necessary (USDA-FS, 1985. pp. 40).

This alternative would allow for stocking of Gila topminnow into Camp Creek, although surface flows may be reduced for up to 20 more years due to domestic use of springs. Impacts to springs under implementation of this alternative would be reduced due to the removal of recreation residences located within the floodplain. Riparian development, which would provide additional stream bank stabilization, would be impacted for at least

20 more years by reduced surface flow. Reduced flows within Camp Creek could reduce the potential for Gila topminnow to occupy Camp Creek during the next ten years. Once homes within the floodplain are removed flows within Camp Creek would increase leading to more stable (permanent water though out the year) conditions for Gila topminnow.

- Maintain a minimum of 30 percent effective ground cover for watershed protection and forage production, especially in primary wildlife forage producing areas. Where less than 30 percent exists, it will be the management goal to obtain a minimum of 30 percent effective ground cover (USDA-FS, 1985, pp. 40). For at least 20 years, ground cover may be less than 30 percent due to lot maintenance and fuel reduction efforts along Camp Creek, Columbine and Grapevine. For homes removed within the flood plain in ten years, ground cover will increase from current condition.
- Rehabilitate and maintain, through improved management practices, mixed broad leaf riparian to achieve 80 percent of the potential overstory crown coverage. Natural regeneration is anticipated to achieve most of this goal. Artificial regeneration may be necessary in some areas (USDA-FS, 1985, pp. 41). This prescription would not be met for at least 20 years (except for homes that would be removed in ten years) due to fuel reduction on lots, displaced riparian habitat and hardening of surfaces (roads, driveways, and parking areas).
- Where channel crossings are necessary, select an area where the channel is straight and cross the channel at right angles (USDA-FS, 1985, pp. 43). This prescription would not be met for at least 20 years due to existence of driveways and roads crossing Camp Creek at various angles. The alternative identifies that, should future repair or replacement of roads serving the tract be required, opportunities to relocate roads out of stream channels would be sought to reduce the number and type of structures that could affect riparian habitat and stream health.
- Avoid channel changes or disturbance of stream channels and minimize impacts to riparian vegetation (USDA-FS, 1985, pp. 43). This prescription would not be met for at least 20 years due to roads crossing Camp Creek except for damage to the stream and riparian area caused by equipment removing burned remains of recreation residence 29.
 - Maintain, improve and protect the desert scrub type to emphasize production of javelina, Gambel's quail and mule deer (USDA-FS, 1985, pp. 68). This prescription would not be met for at least 20 years due to displacement of upland habitat by residences and associated infrastructure.

RIPARIAN ECOSYSTEM

Alternatives 1 through 3

- Rehabilitate and maintain, through improved management practices, mixed broadleaf riparian to achieve at least 80 percent of the potential overstory crown coverage but potentially productive riparian areas (USDA-FS, 1985, pp. 43).
- Manage riparian areas in relation to various legal mandates, including, but not limited to, those associated with floodplains, wetlands, water quality, dredged and fill material, endangered species, wild and scenic rivers and cultural resources.
- Manage riparian areas under the principles of multiple-use and sustained yield, while emphasizing protection and improvement of soil, water and vegetation, particularly

because of their effects upon aquatic and wildlife resources. Give preferential consideration to riparian-dependent resources when conflicts among land use activities occur (FSM 2526.03).

- Give attention to land along all stream channels capable of supporting riparian vegetation (FSM 2526.03, 36 CFR 219.27e).
- Give special attention to land and vegetation for approximately 100 feet from the edges of all perennial streams, lakes, and other bodies of water. This distance shall correspond to at least the recognizable area dominated by the riparian vegetation (FSM 2526.03, 36 CFR 219.27e). Give special attention to adjacent terrestrial areas to ensure adequate protection for the riparian-dependent resources.

LANDSCAPE MANAGEMENT

Alternatives 1 through 3

Regarding landscape management, applicable general guidelines for Management Unit 1F would be met with implementation of each alternative. However, within the analysis area obtainment of visual resource management objectives vary with alternatives. Management for Partial Retention within the Grapevine and Columbine sub-units would be achieved following implementation of each alternative. Management for Retention within the Upper, Middle and Lower Camp Creek sub-units would be achieved within ten years, following removal of structures and reclamation of residence lots, in alternative 1. Management for Retention within the Upper, Middle and Lower Camp Creek sub-units would be achieved within 20 years, following removal of structures and reclamation of residence lots, in alternative 3.

Appendix F- Species Accounts

Gila Topminnow (*Poeciliopsis occidentalis occidentalis*)

Habitat requirements of Gila topminnow are fairly broad; it prefers shallow, warm and fairly quiet waters, but can adjust to a rather wide range, living in quiet to moderate currents, depths to three feet and water temperatures from constant 80°F springs to streams fluctuating from 43-99°F. The species lives in a wide variety of water types; springs, cienegas, marshes, permanent or interrupted streams and formerly along the edges of large rivers. Preferred habitat contains dense mats of algae and debris, usually along stream margins or below riffles, with sandy substrates sometimes covered with organic mud and debris. Gila topminnow food habits are generalized and include bottom debris, vegetative materials, amphipod crustaceans and insect larvae, including mosquitoes. The mode of reproduction in Gila topminnow is internal fertilization of the eggs with internal development of the young. The young are born alive. In constant warm temperature springs, breeding takes place year-round, whereas in fluctuating habitats, breeding occurs from April to August. Damming and diversion of streams, channelization and arroyo cutting and groundwater pumping have altered the natural aquatic ecosystem to such an extent that little habitat is left for the species. The loss of aquatic habitats due to human activity dramatically reduced the amount of habitat available for Gila topminnow.

Longfin Dace (*Agosia chrysogaster*)

The longfin dace is a small, silvery minnow (Cyprinidae) that seldom exceeds four inches in length. Its mouth is slightly subterminal, and there is a minute barbel present on each side of the upper lip. The fish is highly opportunistic, moving rapidly into flowing water during periods of high precipitation and runoff to travel amazing distances in relatively short periods of time. During desiccating conditions, longfin dace persist beneath moist debris and algal mats throughout the day, then become active at night when meager flow returns. Adults tend to congregate in shaded, deep areas when water temperatures exceed 75° F. Thermal mortalities of longfin dace have rarely been observed. Longfin dace is an opportunistic omnivore, consuming primarily insects when the preferred taxon (baetid mayflies) is abundant, but consuming primarily algae when mayfly abundance is low. Other foods include detritus and zooplankton. Longfin dace is perhaps the only native fish species in Arizona that has been helped by the massive erosion that occurred during the past century. Since their preferred habitat is sandy-bottomed, shallow streams, excessive sedimentation has increased the abundance of this habitat type. However, they have disappeared from many areas because of lowered water tables and reservoir construction.

Speckled Dace (*Rhinichthys osculus*)

A small minnow (Cyprinidae), the speckled dace seldom achieves three inches in length. Its body is chunky and somewhat flattened ventrally. Coloration is highly variable, drab olivaceous with patterns ranging from large black blotches on the body, through a single or double lateral band, to almost unicolored (darker above, lighter below). Speckled dace is a bottom dwelling species that inhabits shallow, rocky, headwater streams with relatively swift flow, sometimes in areas with considerable aquatic vegetation. It is found in riffles that are about 0.5 feet deep, with water velocities of about 1.3 feet per second over pebble and cobble substrate. Adult speckled dace appear quite capable of maintaining position in streams during flash flooding, but young are carried downstream, often to their deaths in pools that later desiccate. Although it can acclimate to

temperatures as high as 98° F, the species has a relatively low tolerance for elevated temperatures and reduced oxygen, which accounts for its peak abundance in relatively swift, moderately sized, pool-and-riffle creeks between 5,000 and 10,000 feet elevation. It feeds principally on benthic insects, but also takes algae, other aquatic invertebrates and detritus. Speckled dace feed primarily between 9:00 p.m. and 1:00 a.m. Alteration of historic flow regimes and construction of reservoirs have diminished available habitat for speckled dace. General watershed erosion causing excessive sand deposition has eliminated pool habitat and filled in riffles needed for spawning and food production in many streams.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

The southwestern willow flycatcher is a small Empidonax flycatcher and can only be positively identified in the field by its unique song. It is a Neotropical migrant that breeds in the southwestern United States and winters in Mexico and Central America. It is an insectivore, feeding within and above dense riparian vegetation. It is found in riparian habitats along perennial drainages where dense growth of willows, tamarisk, and other shrubs and medium-sized trees are present with a scattered overstory of cottonwoods. Foraging occurs throughout this habitat. The flycatcher nests in thickets of trees and shrubs approximately 12 to 24 feet tall, with a high percentage of canopy cover and large volume of foliage. Occupied habitat occurs on Tonto Creek and the Salt River near Roosevelt Lake, Horseshoe Reservoir and portions of the Verde River. According to Tibbets and Sogge (1993), threats to the Southwestern willow flycatcher include extensive loss of breeding habitat due to urban, recreational, and agricultural development; water diversion and recreational uses; and hydrological changes resulting from these and other land uses.

Common Black Hawk (*Buteogallus anthracinus*)

The black hawk is associated with aquatic systems throughout its range. Year-round nesting and foraging habitat occurs in association with perennial systems characterized by mature riparian gallery forests, with cottonwoods and willows and sycamores dominating the overstory. Black hawks typically forage within riparian drainages for reptiles, amphibians and small mammals associated with that forest cover type. They nest in large cottonwoods and sycamores and are known to occur in the major drainages (Gila, Salt and Verde) in the central and southern part of the state. The primary threat to the black hawk is the degradation and loss of riparian habitat which could occur as a result of livestock grazing, mineral extraction, water diversions, dams, agriculture, ground water pumping and the invasion of exotic species such as salt cedar and water cress. As stated in the Conservation Assessment for the species, the "common black-hawk is a riparian obligate species occupying the highest trophic level in many riparian areas. Management favoring common black hawks should therefore improve overall riparian conditions.... special attention should be directed at tree regeneration and stream characteristics."

Management Indicator Species (MIS) were selected to adequately monitor the effects of implementation of the Proposed Action in the Forest Plan, on wildlife habitat and species diversity. The common black-hawk was selected as a Management Indicator Species for riparian streamsides (USDA-FS, 1985, App. G). According to the Tonto National Forest Management Indicator Species Status Report (2002), it appears the population is stable, although there is not enough information at this time to assess population trends for this species. The sycamore component for nesting is remaining stable (MIS 2002).

Arizona Bell's Vireo (*Vireo bellii*)

This neotropical migrant breeds from southern California, southern Nevada, Arizona, New Mexico, north to the Midwest to North Dakota and east to Illinois and south to Tennessee, Arkansas, Louisiana, Texas and Mexico. It winters from Mexico south to Central America. The Bell's vireo is dependent on riparian habitats and occupies watercourses and marshes where mesquite is mixed with cottonwoods, willows, salt cedar, elderberry and desert hackberry. It nests in dense riparian shrubs, usually near water. Nests consist of a small, basketlike cup attached to a forked branch of mesquite, hackberry, catclaw, oak, willow, ash, cottonwood or low shrub, seldom more than five feet off the ground. Insects and spiders are the primary food source and are gleaned from leaves and branches. The primary threat to the Bell's vireo is assumed to be degradation and loss of riparian habitat which could occur as a result of livestock grazing, mineral extraction, water diversions, dams, agriculture, ground water pumping and the invasion of exotic species such as salt cedar and water cress.

Management Indicator Species (MIS) were selected to adequately monitor the effects of implementation of the Proposed Action in the Forest Plan on wildlife habitat and species diversity. In the Forest Plan, Appendix G, the Bell's vireo was selected as an MIS species for the low elevation (1,500 to 3,500 ft) riparian vegetation type with a well-developed understory (USDA-FS, 1985).

Trend estimates for Bell's vireo are given to detect percent change in population based upon the number of detections for the species during breeding bird surveys in Arizona. Arizona Bell's vireo detections declined 2.3 percent in Arizona from 1966 to 2005 (Sauer et al., 2005)

Black-throated Sparrow Counts (*Amphispiza bilineata*)

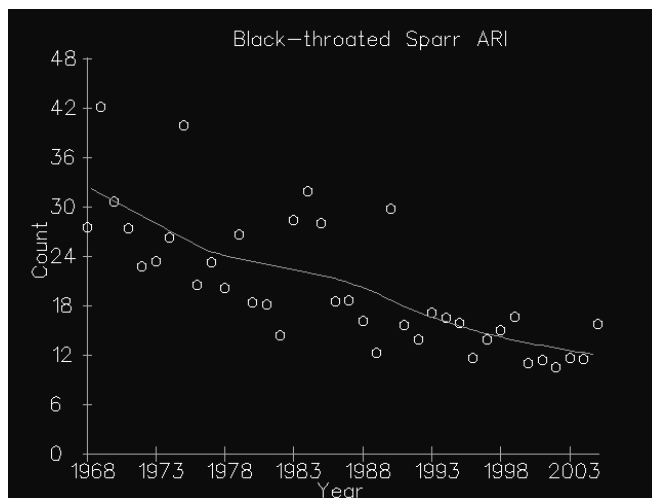


Figure 3-4 Black-throated Sparrow Counts (*Amphispiza bilineata*)

This species occurs semi-open habitat with evenly spaced shrubs and trees from approximately three to nine feet tall (Johnson et al., 2002), and especially in rocky uplands in desert scrub (Ehrlich et al. 1988). Black throated sparrows occur in desert alluvial fans, canyons, washes, flats, badlands, and desert scrub type such as creosote bush, ocotillo, cholla, mesquite, catclaw acacia, blackbrush, sagebrush, antelope brush, and rabbit brush, interspersed with taller plants such as Joshua trees, piñon-juniper, and crucifixion thorn (Johnson et al. 2002). Desert scrub habitat with less than 25 percent

vegetative cover is preferred, and water sources during the dry season are necessary for this species in the southwest (USDA-FS, 1994). During the non-breeding season, this species can be found in riparian areas, grasslands, and weedy fields, as well as in xeric shrub habitats (AOU, 1983; Rising, 1996). During the breeding season, black-throated sparrows prey items include grasshoppers, butterfly and moth larvae, mantids, robber flies, walking sticks and dragonflies (Johnson et al., 2002). This species feeds mainly on the ground, taking a variety of insect prey and seeds during breeding season, and seeds such as storksbill, large grasses, small grasses, creosote plant material and prickly-pear cactus (Johnson et al., 2002). They also glean foliage on the lower portions of shrubs and trees and occasionally flush and make short aerial chases to capture prey (Zimmer, 1983). During the non-breeding season, this species may forage in mixed flocks (Ehrlich, et al. 1988; Rising, 1996). Loss of habitat due to clearing of desert and mesquite for agricultural and residential developments may threaten some populations, since black-throated sparrows do not use urban landscaped vegetation (Emlen, 1974; Mills, Dunning, and Bates, 1989). Both black-throated sparrows and canyon towhees are especially susceptible to urban development and were found in greatly reduced numbers in urban environments, regardless of the use of native vegetation (Mills et al., 1989).

Management Indicator Species (MIS) were selected to adequately monitor the effects of implementation of the Proposed Action in the Forest Plan, on wildlife habitat and species diversity. In the Forest Plan (USDA-FS, 1985, App. G), the black-throated sparrow was selected as a Management Indicator Species for shrub diversity in the Desert scrub vegetative type.

Trend estimates for black-throated sparrow are given to detect percent change in population based upon the number of detections for the species during breeding bird surveys in Arizona. Black-throated sparrow detections declined 2.8 percent in Arizona from 1966 to 2005 (Sauer et al., 2005).

Canyon Towhee (*Pipilo fuscus*)

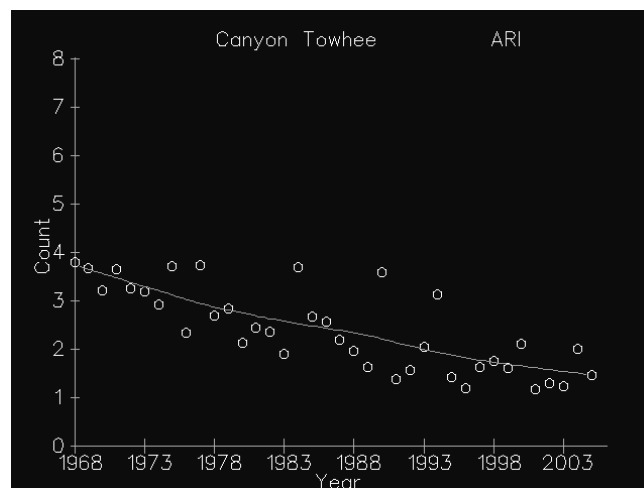


Figure 3-5. Canyon Towhee Counts

Canyon towhees are “sedentary, permanent residents of the southwest (Johnson and Haight 1996).” This species occurs in a variety of the drier habitats in the southwest,

except in heavily urbanized areas. They most typically are found in the Upper Sonoran desert grasslands, often in remote, rocky areas with dense shrubs. They also occupy scrub along dry desert washes, desert mesquite in riparian areas, upland desert scrub at lower elevations, plus grasslands with dense stands of chaparral or pine-oak-juniper and some coniferous forest (Johnson and Haight, 1996). At lower elevations or latitudes, mesquite, paloverde, Mexican elderberry, and net leaf hackberry (Marshall and Johnson, 1968) are often used for nesting. In general, nests are found lower to the ground at higher elevations, and higher at lower elevation sites (Johnson and Haight, 1996).

According to Marshall (1960), “pairs persist normally for the life of the mates and exist only in conjunction with the holding of a territory.” Main breeding activity begins in mid-March and goes through mid-October (Johnson and Haight, 1996).

Management Indicator Species (MIS) were selected to adequately monitor the effects of implementation of the Proposed Action in the Forest Plan on wildlife habitat and species diversity. In the Forest Plan (USDA-FS, 1985, App. G), the canyon towhee was selected as a Management Indicator Species for ground cover in the Desert scrub vegetative type.

Trend estimates for canyon towhee are given to detect percent change in population based upon the number of detections for the species during breeding bird surveys in Arizona. Canyon towhee detections declined 2.8 percent in Arizona from 1966 to 2005 (Sauer et al., 2005).

Summer Tanager (*Piranga rubra*)

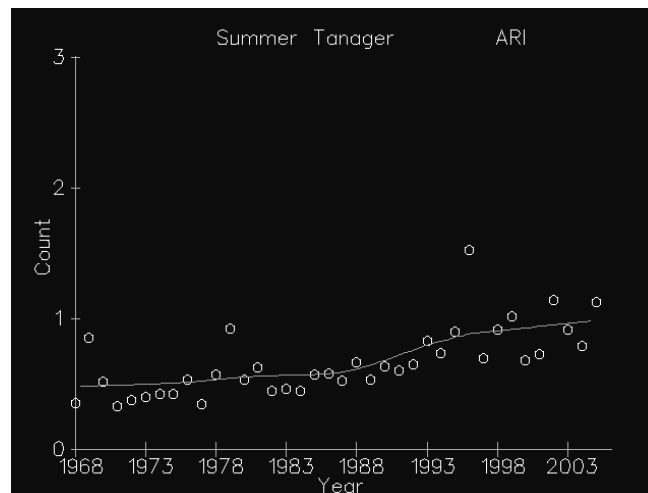


Figure 3-6. Summer Tanager Counts

In the western states, summer tanagers are found in cottonwood-willow riparian forest along streams and in canyons at lower elevation (Grinnell, 1914; Bent, 1958; Rosenberg et al., 1982 and 1991). Mesquite and salt cedar are used as breeding habitat at higher elevations (Robinson, 1996). Mid-and higher levels in the canopy are used for foraging and nesting by summer tanagers (ibid.). The greatest breeding activity begins in mid-March throughout the summer tanager’s range, and lasts until early April (Robinson, 1996). Summer tanagers are renowned for eating bees and wasps (Hamaher, 1936a; Rau, 1941; Bent, 1958). They catch bees and wasps in flight, carry them back to a

perch, beat the prey against the perch to kill it, and then swipe the prey against the branch to remove the stinger (Bent, 1958). They will also harass adult bees or wasps until they leave their hive, and then tear off pieces of the hive to eat the larvae (Hamaher, 1936; Rau, 1941; Alvarez del Toro, 1950). These tanagers will also hawk or hover-glean a wide variety of insects such as cicadas, hymenopterans, spiders, coleopterans, ants or termites, grasshoppers, dipterans and hemipterans from foliage (Rosenberg et al., 1982). They forage in cottonwood-willow gallery forests in Arizona.

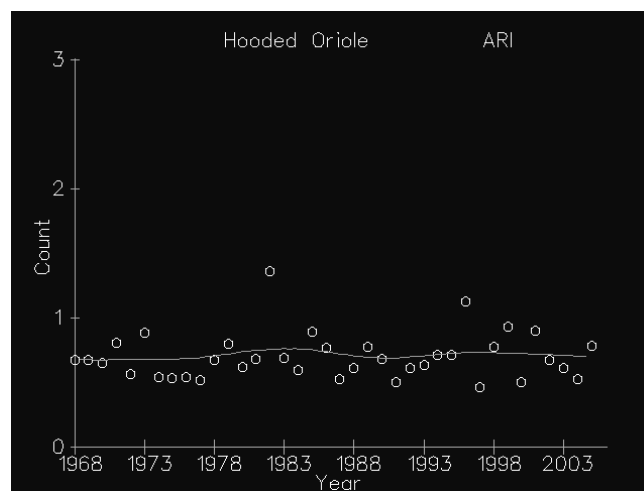
Management Indicator Species (MIS) were selected to adequately monitor the effects of implementation of the Proposed Action in the Forest Plan on wildlife habitat and species diversity. In the Forest Plan (USDA-FS, 1985, App. G), the summer tanager was selected as a Management Indicator Species for tall, mature trees in low elevation riparian vegetation, ranging from 1,500 to 3,500 feet elevation.

Trend estimates for summer tanager are given to detect percent change in population based upon the number of detections for the species during breeding bird surveys in Arizona. Summer tanager detections increased 3.1 percent in Arizona from 1966 to 2005, although due to the small sample size trend may not be determined (Sauer et al., 2005)

Hooded Oriole (*Icterus cucullatus*)

In Arizona, hooded orioles obtain their highest breeding densities in riparian communities containing tall stands of deciduous trees. Hooded orioles are found most frequently in lowland drainages with Fremont cottonwoods, willows and mesquite, and in lower canyons and foothill drainages dominated by Arizona sycamore, walnut and ash. Hooded orioles have also been encountered fairly regularly nesting along desert dry washes containing dense stands of netleaf hackberry, mesquite, paloverde or ironwood. Occupied dry washes often include taller, older trees with an abundance of mistletoe in which they frequently construct their nest. In rural and residential areas of Arizona, most nests are placed in fan palms, while along perennial drainages hooded orioles prefer

Figure 3-7. Hooded Oriole Counts



Arizona sycamore, Fremont cottonwood and velvet ash. Netleaf hackberry along dry washes is favored in semiarid grasslands and in the Sonoran Desert, nests are most frequently found in mistletoe clumps in paloverde, mesquite, and catclaw acacia along

larger washes (Corman et al., 2005). Hooded oriole diet consists of a variety of insects, along with flower nectar, fruit and other plant materials (ibid).

Management Indicator Species (MIS) were selected to adequately monitor the effects of implementation of the Proposed Action in the Forest Plan on wildlife habitat and species diversity. In the Forest Plan (USDA –FS, 1985, App. G), the hooded oriole was selected as a Management Indicator Species for medium-sized trees in low elevation riparian vegetation, ranging from 1,500 to 3,500 feet elevation.

Trend estimates for hooded oriole are given to detect percent change in population based upon the number of detections for the species during breeding bird surveys in Arizona. Hooded oriole detections increased 0.3 percent in Arizona from 1966 to 2005 (Sauer et al., 2005).

Western Wood Pewee (*Contopus sodidulus*)

Western wood pewees are habitat generalists, breeding in relatively open coniferous and coniferous-deciduous forests, forest edges and poplar or riparian woodlands at elevations ranging from sea level to over 9,000 feet. In Arizona, nesting areas are provided by sycamores, cottonwoods, and other trees along mountain streams at approximately 4,900 to 5,900 feet elevation (Terres, 1980), riparian woodland approximately 2,950 to 3,280 feet (Carothers et al., 1974), ponderosa pine forest, and pine-oak-juniper habitat (Cody, 1981). The main foods taken are flying insects, especially flies, ants, bees, wasps, beetles and bugs (Bemis and Rising, 1999). Western wood pewees forage from high, exposed perches on the tops and outer canopy of trees, as well as telephone wires, (Verbeek, 1975) by sitting and waiting and then flying out to catch prey.

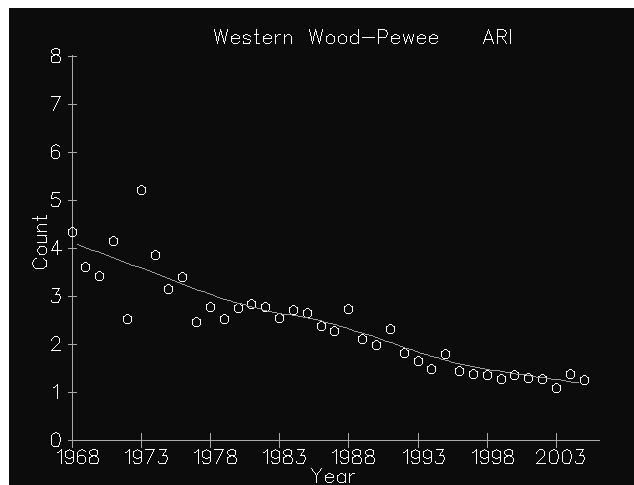


Figure 3-8. Western Wood-Pewee Counts

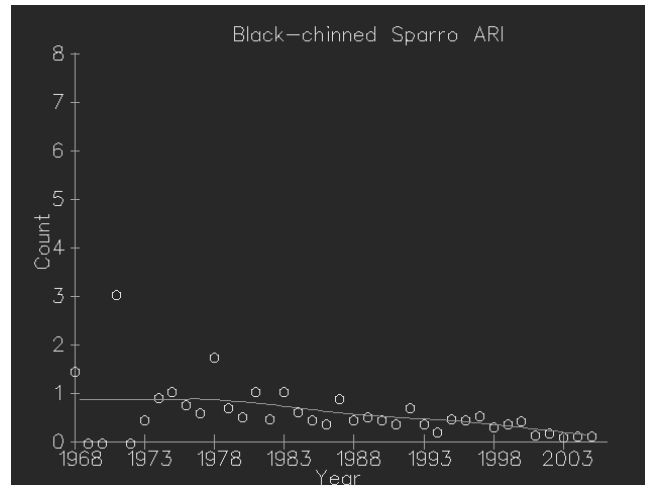
Management Indicator Species were selected to adequately monitor the effects of implementation of the Proposed Action in the Forest Plan on wildlife habitat and species diversity. In the Forest Plan (USDA-FS, 1985, App. G), the western wood-pewee was selected as a Management Indicator Species for the High Elevation (>3,000 ft) Riparian Vegetation Type and was considered to be an indicator for medium riparian overstory.

Trend estimates for western wood-pewee are given to detect percent change in population based upon the number of detections for the species during breeding bird

surveys in Arizona. Western wood-pewee detections decreased 3.7 percent in Arizona from 1966 to 2005 (Sauer et al., 2005).

Black-chinned Sparrow (*Spizella astrogularis*)

Figure 3-9. Black-chinned Sparrow Counts



Arizona has both migratory and resident populations of black-chinned sparrows, with migratory birds arriving in their breeding grounds in March and April. Typically inhabiting mid-elevation in Arizona, this species is encountered nesting in a variety of arid, brushy and generally sloping habitats. Steep mountain slopes and remote ridges covered with dense chaparral vegetation are especially favored in central Arizona. Characteristic woody shrubs at these locations include shrub live oak, manzanita, mountain mahogany and Apache plume (Corman et al., 2005). The brush inhabited by black-chinned sparrows is usually three to 6.5 feet tall. Black-chinned sparrows prefer young stands with openings through the brush and avoid overgrown stands. Habitat quality may benefit with recurrent fires, dependent on the vegetation type and region. The main prey items of black-chinned sparrows are adult and larval insects. During the winter, food consists mainly of the seeds of grasses and forbs.

Management Indicator Species were selected to adequately monitor the effects of implementation of the Proposed Action in the Forest Plan on wildlife habitat and species diversity. Management Indicator Species (MIS) were selected to adequately monitor the effects of implementation of the Proposed Action in the Forest Plan on wildlife habitat and species diversity. In the Forest Plan (USDA-FS, 1985, App. G), the black-chinned sparrow was selected as a Management Indicator Species for the chaparral vegetative type as an indicator of shrub diversity.

Trend estimates for black-chinned sparrow are given to detect percent change in population based upon the number of detections for the species during breeding bird surveys in Arizona. Black-chinned sparrow detections decreased 4.9 percent in Arizona from 1966 to 2005, although due to the small sample size trend may not be determined (Sauer et al., 2005).

White-throated Swift (*Aeronautes saxatalis*)

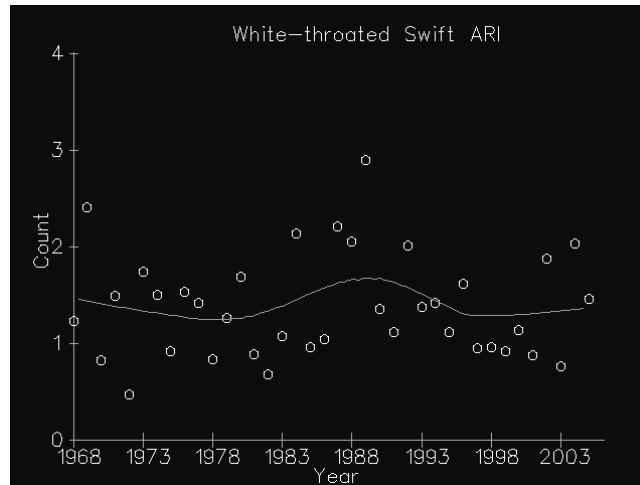


Figure 3-10. White-throated Swift Counts

Highly social white-throated swifts are found statewide in conjunction with steep canyon walls, cliffs, pinnacles and ridgelines offering blank expanses of open rock. These birds occupy a wide variety of habitats and elevation ranges, and all are related only in the availability of nearby cliffs with adequate nesting and roost sites. These gregarious birds have been observed in 25 different habitat types. Sonoran Desert uplands and pinyon-juniper woodlands were the most frequented habitat types (Corman et al., 2005). Swifts never perch on trees or wires nor do they alight on the ground. Their lives are spent in the air: they even mate in mid-air. A grounded swift cannot take flight and must starve if it cannot climb. The species feeds on swarms of insects, often ants, high in the air (Phillips et al., 1964).

Trend estimates for white-throated swift are given to detect percent change in population based upon the number of detections for the species during breeding bird surveys in Arizona. White-throated swift detections remained relatively stable in Arizona from 1966 to 2005 (Sauer et al. 2005).

Elf Owl (*Micrathene whitneyi*)

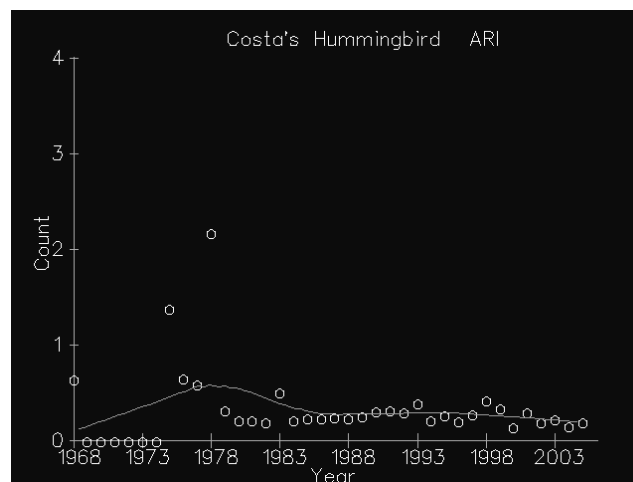
The world's smallest owl (Phillips et al. 1964) occur in open Sonoran Desert landscapes, typically in areas with an abundance of saguaros and scattered thorny trees such as paloverde, ironwood and mesquite. The species occurs in lower numbers within nearby densely wooded dry washes and lowland riparian woodlands of cottonwood, willow and mesquite (Corman et al., 2005). Preferred habitats are generally cavity-rich, and owl density is correlated to the relative abundance of nest holes (Henry and Gehlbach, 1999). Elf owls nest in natural and woodpecker-constructed cavities in substrates such as saguaro, mesquite, cottonwood and willow in lowland areas. It is a nocturnal species primarily foraging on insects.

Trend estimates are unavailable for this species.

Costa's Hummingbird (*Calypte costae*)

Even though some Costa's hummingbirds are resident, most of the breeding populations begin to arrive in mid-to-late October, with numbers building in to early winter just prior to the Sonoran desert bloom. Costa's hummingbird is Arizona's smallest breeding bird, which nests primarily in Sonoran and Mojave Desert scrub associations where they prefer dry washes, canyons and rocky slopes. According to Corman, approximately 33 percent of all Breeding Bird Atlas records in Arizona were reported from well-vegetated Sonoran Desert uplands, with only 13 percent from the more arid, sparsely vegetated Sonoran Desert lowlands (Corman et al., 2005). Desert washes are especially favored for nesting and accounted for an additional 30 percent of Costa's hummingbird records during the atlas (Corman et al., 2005). Plant species within preferred habitat include paloverde, mesquite, ironwood, acacia, creosote, ocotillo, jojoba and saguaro. Nesting areas are often associated where chuparosa, ocotillo and other tubular flowering desert plants abound (Scott, 1994). Costa's hummingbird has been found to be most common in the Sonoran desert regions of central and southwestern regions of Arizona, especially following wet winters. Greatest threats to Costa's hummingbird in Arizona are desert wildfires and urban sprawl (Corman et al., 2005). These wildfires often kill paloverde and other nesting trees over large areas (Baltosser and Scott, 1996).

Figure 3-11. Costa's Hummingbird Counts



Trend estimates for Costa's hummingbird are given to detect percent change in population based upon the number of detections for the species during breeding bird surveys in Arizona. Costa's hummingbird detections decreased 3.2

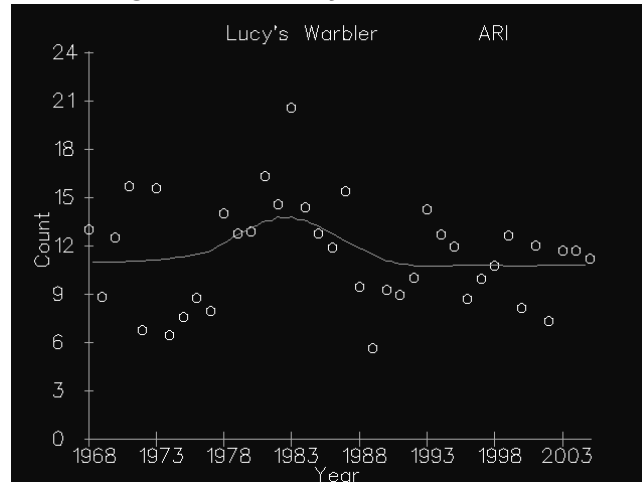
percent in Arizona from 1966 to 2005, although due to the small sample size trend may not be determined (Sauer et al., 2005).

Lucy's Warbler (*Vermilvora luciae*)

In Arizona, the first Lucy's warblers typically arrive in early March, irregularly in late February. Nesting activity generally begins in early April. Lucy's warblers are most abundant along perennial or intermittently flooded drainages containing mesquite. Corman reported that Arizona Breeding Bird watchers reported the majority of these warblers (54 percent of all Arizona records) from Sonoran desert dry washes containing large mesquite, ironwood and paloverde and in the immediately adjacent upland desert scrub (Corman et al., 2005). However in Arizona, they appear to reach their highest density in the few remaining large mesquite bosques and in dense cottonwood-willow riparian woodlands where 16 percent of all Arizona records were reported. This lower percentage is likely related to the scarcity and local distribution of native lowland riparian areas compared to the more widespread and abundant desert washes. Bird watchers

found most Lucy's warblers nests in trees or snags, including mesquite, cottonwood, willow, paloverde, ironwood, Arizona sycamore, netleaf hackberry, Arizona walnut, catclaw acacia and Emory oak.

Figure 3-12. Lucy's Warbler Counts



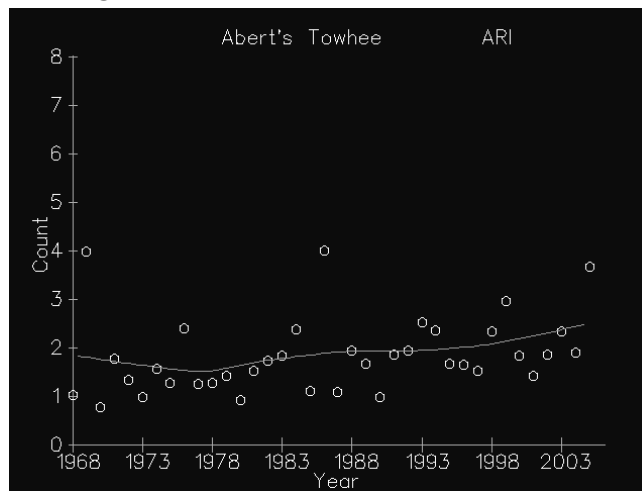
Trend estimates for Lucy's warbler are given to detect percent change in population based upon the number of detections for the species during breeding bird surveys in Arizona. Lucy's warbler detections decreased 0.3 percent in Arizona from 1966 to 2005 (Sauer et al., 2005).

Abert's Towhee (*Pipilo aberti*)

The nesting season for Abert's towhee can begin as early as late January (Corman et al., 2005). Abert's towhee are typically encountered in or near habitats where the under story is dense and the soil is often damp. They reach their highest densities in the lowland riparian thickets containing Fremont cottonwood, Gooding's willow, seepwillow and mesquite. Abert's towhee also take advantage of the dense growth of adjacent desert dry washes that empty into these wetter drainages.

According to Corman, these two habitats accounted for approximately 63 percent of all Arizona Breeding Bird Atlas records for this species (Corman et al., 2005). Use of desert dry washes is much more prevalent following winters and springs with above average precipitation. This is one of the few riparian species that has adapted fairly well to the monotypic thickets of exotic tamarisk now growing abundantly along many of Arizona's lowland waterways. Nest sites the species selected have included: mesquite, wolfberry, graythorn, seepwillow, velvet ash, Mexican elderberry, cottonwood, willow, catclaw acacia, netleaf hackberry and frequently in mistletoe clumps. The loss of this towhee's preferred native riparian habitat throughout its range has likely reduced the overall population numbers (Corman et al., 2005).

Figure 3-13. Abert's Towhee Counts



Trend estimates for Abert's towhee are given to detect percent change in population based upon the number of detections for the species during breeding bird surveys in Arizona. Abert's towhee detections increased 1.8 percent in Arizona from 1966 to 2005 (Sauer et al. 2005).

Western Red Bat (*Lasiurus blossevillei*)

Red bats have the broadest distribution of any American bat, ranging from extreme southern Canada through the United States east and west of the Great Plains, and south to Panama and South America. In Arizona, the red bat is thought to be a summer resident only. It occurs statewide, except in desert areas, but primarily along riparian corridors among oaks, sycamores and cottonwoods and along other waterways in the central and southeastern parts of the state. Red bats are generally known to occur at elevations ranging from 2,400 to 7,200 feet. While red bats occasionally roost in saguaro boots and other cavities, they are more typically found roosting in dense clumps of foliage in riparian or other wooded areas. Roost sites are shaded above and tend to be open below, permitting the bats to drop into flight. When roosting, the red bat often wraps itself in its furred tail membrane and hangs from a branch by one or both feet. Red bats emerge to forage one to two hours after dark and may forage well into the morning. They feed mainly upon flying insects; they feed to a much lesser extent on ground-dwelling insects, such as crickets. The chief threats to the red bat in Arizona are its apparently low numbers and the loss of riparian and other broad-leaved deciduous forests and woodlands. Humans and human construction is also a threat to the red bat. There have been documented cases of these bats being impaled by barbed wire, entrapped on road surface oil, flying into buildings and radiator grills of automobiles.

Townsend's Big-eared Bat (*Plecotus townsendii*)

In Arizona, this species occurs throughout the state, although it is only infrequently found in the desert mountains. During the winter, it is found mostly south of the Mogollon Plateau and northwest of Mohave County. The distribution of this bat tends to be geomorphically determined, and is strongly correlated with the availability of caves or cave-like roosting habitat e.g., old mines. Population concentrations occur in areas with substantial surface exposures of cavity forming rock and in old mining districts. *Plecotus townsendii* has been found from 1,200 to 5,600 feet. Most records, however, seem to come from above 3,000 feet.

Townsend's big-eared bats hang from open ceilings of mines and caves during the day. They do not use cracks or crevices, and may use open abandoned buildings as a night roost. In Arizona, they hibernate during the winter in cold caves, lava tubes and mines mostly in uplands and mountains from the vicinity of the Grand Canyon to the southeastern part of the state, south of the Mogollon Rim.

P.townsendii are Lepidopteran specialists with a diet consisting of greater than 90 percent moths. They forage in darkness and are rarely seen at dusk. Following a late night peak of foraging activity, they usually rest in a night roost. They may also feed again shortly before dawn.

Populations of this species are threatened by habitat loss, vandalism and disturbance by cave explorers at maternity and hibernation roosts. Human disturbance can cause permanent abandonment of roost sites; therefore, minimization of human disturbance is essential for *Plecotus townsendii* to remain in existence. Low reproductive potential, high longevity and high roost fidelity make *P.townsendii* populations highly sensitive to roost threats. Besides humans, predators of this species, including feral house cats, bobcats, screech owls and snakes, have led to the decline of this animal.

The presence of suitable shelters seems to be one of the important limiting factors for this species. The loss of caves and mines to natural erosion has been suggested as a possible threat to *P.townsendii* populations; however, these losses appear to happen over a span of decades and or centuries rather than months or years and likely provide adequate time for populations to adjust.

Lowland Leopard Frog (*Rana yavapaiensis*)

Found in from Sonoran desert scrub to great basin conifer woodland and madrean evergreen woodland, lowland leopard-frog lives in permanent or semi-permanent water. The species is usually found along streams or rivers with dense vegetation such as cottonwood and willow, but also in ponds, cienegas, springs, cattle tanks, wetlands and ditches (Brenan and Holycross, 2006). Based on records in the AGFD database, this species occurs between 480 and 5960 feet in elevation. Sredl et al. have conducted Forest wide amphibian and aquatic reptile surveys annually since 1991. Sredl (1997) commented that the lowland leopard frog is the most stable native ranid in Arizona and its status in central Arizona seems good. Tonto National Forest personnel and other AGFD personnel have conducted additional, site-specific surveys. Surveys were conducted according to accepted protocols for potential species. Locations have been documented from Bloody Basin, Cave Creek, the Verde River, Sycamore Creek west of Sugarloaf Mountain, Mazatzal Mountain creeks, tributaries from the Sierra Anchas and many more. This species primarily eats invertebrates and some small vertebrate prey.

Bullfrogs, crayfish, tiger salamanders and exotic fishes all contribute to major negative effects on native populations of leopard frogs. Populations of lowland leopard frogs may be especially susceptible to events such as severe floods and droughts. These events may destroy or alter habitats so that recolonization may take several years.

Arizona Southwestern Toad (*Bufo microscaphus microscaphus*)

Arizona Southwestern toad occurs from eastern to west central Arizona in association with permanent pools, rocky streams and canyons, appearing to select for shallow water flowing over sandy or rocky bottoms. The species is usually found along rocky, shallow streams from Arizona upland desert scrub to petran montane conifer forest. Does not depend upon spring or summer rains to stimulate reproduction (maybe a function of preference for perennial waters).

The non-game branch of the Arizona Game and Fish Department has conducted surveys for herp species on the Tonto NF since 1991. Tonto National Forest personnel and other AGFD personnel have conducted additional, site-specific surveys. Observations of Southwestern toads have been documented from Pinto Creek, Cave Creek, within and south of Cherry Creek, from within Spring Creek, from one unnamed tank within the vicinity of Crouch Creek, Webber Creek, Tonto Creek and from the East Verde River NE of Payson. Adults are nocturnal. Diet includes a variety of invertebrates, including insects. Alteration of habitat may be a threat to some populations (Brenan and Holycross, 2006).

Sonoran Desert Tortoise (*Gopherus agassizii*)

The Sonoran desert tortoise inhabits Arizona upland Sonoran desert scrub and Mojave Desert scrub and is a completely terrestrial desert species, requiring firm, but not hard ground for construction of burrows. The species use shelters from the extreme heat of summer and cold of winter in burrows it excavates below rocks, boulders or vegetation. Also uses naturally occurring rock shelters and cavities in wash banks. Most active in the relatively mild conditions of spring and during the summer monsoon rains. This species occurs across much of southwestern Arizona's Sonoran desert, principally in rocky foothills and less often on lower bajadas and in semi desert grassland. Creosote bush is often present in its habitat. The tortoise eats grass, herbs, forbs, trees, shrubs and succulents. Major threats are population fragmentation, habitat degradation, habitat fragmentation from urban development and genetic contamination by escaped captives. Desert Tortoise Council members believe the species is declining over most of its range and this decline is especially evident in the Phoenix and Tucson areas (TNF Species Abstracts, 2000). Upper respiratory disease has been introduced into some wild populations and has reached epidemic proportions at some localities in the Mojave Desert.

Other Wildlife

Other wildlife that occur within the project area include but are not limited to: mule deer (*Odocoileus hemionus*), Coues white-tailed deer (*Odocoileus virginianus couesi*), mountain lion (*Felis concolor*), peccary (*Pecari angulatus*), gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), rock squirrel (*Citellus variegatus*), ringtail (*Bassariscus astutus*), raccoon (*Procyon lotor*), skunk (*Mephitis sp.*), Merriam chipmunk (*Eutamias merriami*), pocket mice (*Perognathus sp.*), kangaroo rat (*Dipodomys sp.*), wood rat (*Neotoma sp.*), harvest mice (*Reithrodontomys sp.*), whiptail lizards (*Aspidoscelis sp.*), Western banded gecko (*Coleonyx variegates*), ornate tree lizard (*Urosaurus ornatus*), common side-blotched lizard (*Uta stansburiana*), zebra-tailed lizard (*Callisaurus draconoides*), desert spiny lizard (*Sceloporus magister*), Clark's spiny lizard (*Sceloporus clarkii*), Gila monster (*Heloderma suspectum*), horned lizard (*Phrynosoma sp.*), Sonoran coral snake (*Micruroides euryxanthus*), variable sand snake (*Chilomeniscus stramineus*), common kingsnake (*Lampropeltis getula*), long-nosed snake (*Rhinocheilus lecontei*), groundsnake (*Sonora semiannulata*), gophersnake (*Pituophis catenifer*), coachwhip (*Masticophis flagellum*), Western lyresnake (*Trimorphodon biscutatus*), Western diamond-backed rattlesnake (*Crotalus atrox*), Mojave rattlesnake (*Crotalus scutulatus*), black-tailed rattlesnake (*Crotalus molossus*), tiger rattlesnake (*Crotalus tigris*), speckled rattlesnake (*Crotalus mitchellii*), Arizona black rattlesnake (*Crotalus Cerberus*), Sonoran desert toad (*Bufo alvarius*), great plains toad (*Bufo cognatus*), Woodhouse's toad (*Bufo woodhousii*), red-spotted toad (*Bufo punctatus*) and canyon treefrog (*Hyla arenicolor*).

Appendix G- Forest Plan Amendment Language

Alternative 2

Plan Amendment No. 27

Management Area 1F, Page 68

Management Prescriptions

Decision Units	Activities	Applicable Management Areas	Standards and Guidelines
DU 1	A16	6002	The Recreation Residence term special use permits (FS-2700-18 [6/88]) for established lots within the Camp Creek Recreation Residence Area will be continued provided the residence is in compliance with the terms and conditions of the permit.
DU 2	A04	6002	Provide interpretive information on the history of the Recreational Residences and the riparian community when opportunity exists.
DU 11	A16	6002	In Analysis Area 6002 the goals of riparian ecosystem conditions and key fish and wildlife habitat improvements (such as reducing impacts to the stream channel from road crossings, trails and removing or relocating driveways where possible) will be accomplished through project specific actions.
DU 10,11,12,13	C01	6002	In Analysis Area 6002 the management goal will be to have a 30% ground cover.
DU 34	L04, L19,L20, L21	6002	In Analysis Area 6002 when an opportunity arises to relocate, remove, or reduce impacts to the stream from a road, trail or driveway, project specific actions will be identified.

Alternative 3

Plan Amendment No. 27

Management Area 1F, Page 68

Management Prescriptions

Decision Units	Activities	Applicable Management Areas	Standards and Guidelines
DU 1	A16	6002	The Recreation Residence term special use permits (FS-2700-18 [6/88]) for all existing recreation residences and lots outside the 100-year floodplain within the Camp Creek Recreation Residence Area will continue in effect provided the permit holder is in compliance with the terms and conditions of the permit.
DU 2	A04	6002	Provide interpretive information on the history of the Recreational Residences and the riparian community when opportunity exists.
DU 11	A16	6002	In Analysis Area 6002 the goals of riparian ecosystem conditions and key fish and wildlife habitat improvements (such as reducing impacts to the stream channel from road crossings, trails and removing or relocating driveways where possible) will be accomplished through project specific actions.
DU 10,11,12,13	C01	6002	In Analysis Area 6002 the management goal will be to have a 30% ground cover
DU 34	L04, L19,L20, L21	6002	In Analysis Area 6002 when an opportunity arises to relocate, remove, or reduce impacts to the stream from a road, trail or driveway, project specific actions will be identified.